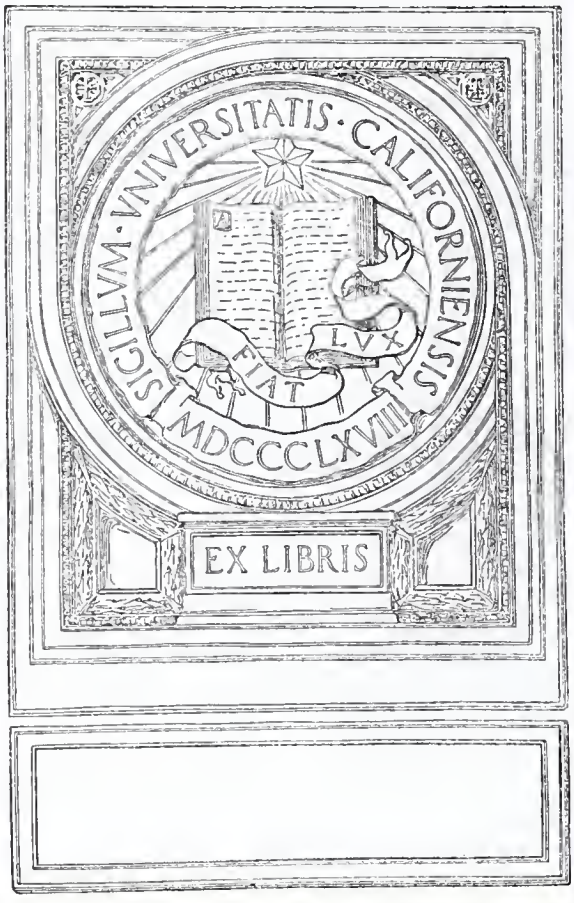
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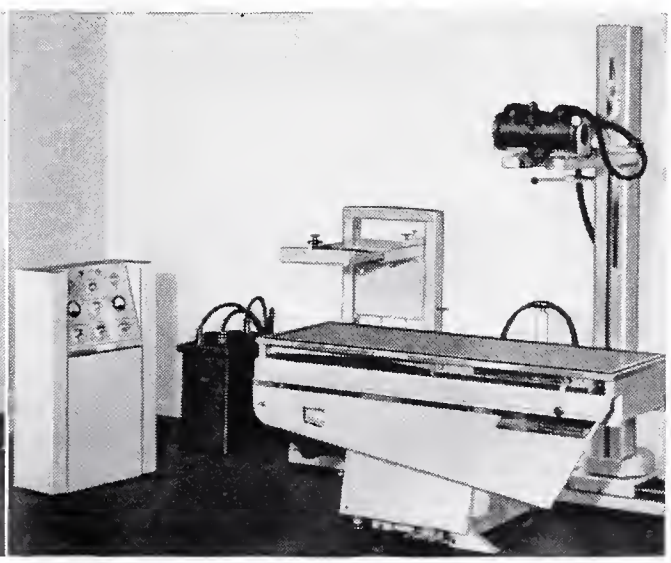
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Muscle meat is a good source of the newly isolated vitamin B_{12}; liver and kidney are especially high in their vitamin B_{12} content, while plant foods are negligible sources of this nutrient.[1] By rat assay, the minimum amounts of vitamin B_{12} in muscle meat range from 0.5 to 3 mcg. per 100 Gm.; minimum values for beef liver and kidney are 15 and 20 mcg., respectively.[2]

B_{12} is among the most potent of known microbiologically active substances.[3] Animal studies indicate that it increases the ability of the normal mammal to utilize protein.[4] With a high protein diet, 0.01 mcg. of vitamin B_{12} per day was found to increase significantly the growth rate of B_{12} deficient rats. In another study, growth response of B_{12} depleted rats was proportional to the B_{12} in the ration within the critical range of 0.025 to 0.1 mcg. per rat day.[5]

About 1 mcg. of vitamin B_{12} daily, administered intramuscularly, constitutes an effective dose in pernicious anemia. In a recent clinical study of young children manifesting vitamin B_{12} deficiency as evidenced by malnutrition and growth failure, oral administration of 10 mcg. of vitamin B_{12} daily for eight weeks induced marked responses in growth; notable increases in vigor, alertness and better general behavior; and improved appetite.[6]

Here again is further evidence of the broad, over-all nutrient contribution meat makes to the dietary. Eaten two or three times daily, it supplies not only generous amounts of high quality protein, but also significant quantities of vitamin B_{12} and other essential B complex vitamins, and of iron.

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Scientific Articles

EVALUATION OF KIDNEY CANCER

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ST. LOUIS
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ST. LOUIS

MALIGNANCY OF THE KIDNEY is one of the most difficult of all urologic problems. Increasing knowledge of the behavior of renal neoplasms has improved mortality appreciably.

Different types of renal tumor vary in their behavior and a knowledge of these variations, gained from experience and from statistical study of large series of cases as reported by others is essential for the efficient management of renal cancer, which comprises 7.6 per cent of all urologic neoplasms as determined in a survey by one of us (E. H. B.) in 1936 at Memorial Hospital, New York.

MATERIAL FOR STUDY

This report consists of 110 cases collected in private practice during the last thirty-eight years. Follow-up data was not all that could be desired and any case not traceable for more than six months was considered lost. Operative mortality was determined as a period not in excess of six weeks. Several patients reported initially in a hopeless and sometimes moribund condition.

AGE AND SEX

The age and sex incidence showed some definite trends. The most frequent decade for renal neoplasm occurred in the 60 to 69 age group for both sexes for a total of thirty-four instances, or 31 per cent of 110 cases. The youngest patient was 17 months old and the oldest was 84 years. There were seventy-two males, or 65 per cent, to thirty-eight females, or 35 per cent of all cases.

LOCATION AND SEX

The left kidney was involved most frequently in both sexes. Sixty cases involved the left kidney and fifty the right. The right kidney was affected thirty-two times and the left forty in the males. The right kidney was involved eighteen times and the left twenty times in the female.

DIAGNOSIS

The various types of malignancy of the kidney appeared with the following frequency: hypernephroma, forty-three cases (39.1 per cent); adenocarcinoma, thirty-four cases (30.9 per cent); carcinoma, of the renal pelvis, fourteen cases (12.7 per cent); Wilm's tumor, eight cases (7.3 per cent); sarcoma, three cases (2.7 per cent); unclassified, eight cases (7.3 per cent).

SYMPTOMS

The classical triad of hematuria, pain and mass might more properly be stated as "hematuria, pain or mass." Even advanced cases have had but one of these symptoms and the pain, too, may be misinterpreted by the passage of clots down the ureter of the affected side in cases in which gross hematuria exists. Any one of the three symptoms makes a complete urologic examination imperative if the presence of malignancy is to be determined. Gross hematuria occurred in seventy-three or 66.4 per cent of the 110 cases. Pain (not colicky in nature) occurred in eighteen or 16.4 per cent. Mass that was from just palpable to enormous, irregular or fixed, was observed in fifty-four or 49.1 per cent. The high incidence of this finding shows that almost half of the cases included in this report were in the advanced stage. Loss in weight was found in only nine cases, or 8.2 per cent, an admittedly low incidence. On the initial cystoscopy, and practically all cases had retrograde pyelograms, a filling pathognomonic defect was noted in only forty-three cases, or 39.1 per cent. This low incidence is due to incomplete records. At the time the patients were first examined a total of twenty cases, or 18.2 per cent, exhibited metastases, eight of which were vesical implants.

DURATION OF SYMPTOMS

The duration of symptoms is a major factor in

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the modern treatment of cancer but the surgeon sees fatal procrastination and neglect almost as frequently as ever. Of the 110 cases of neoplasm in this study, accurate data as to the duration of symptoms was determined in seventy-three. Twenty-four cases reached the urologist in less than one month. About twenty cases had symptoms for from one to five years and a total of forty-six, or 65.6 per cent, of the cases had had symptoms for more than one month. The overall average duration of symptoms was 9.2 months.

THERAPY

Improvements in treating kidney tumors come from experience and observation. Greater attention is now given to the involvement of the kidney pedicle in the tumor mass and the presence of affected lymph nodes. Preoperative x-ray treatment in hypernephroma may reduce the size of the mass but fatal hemorrhage from friable veins covering the kidney has been reported. Papillary tumors of the kidney pelvis quite regularly involve the ureter and adjacent bladder mucosa and necessitate complete removal of all involved tissue. The greatest improvement in mortality has been seen in the treatment of Wilm's tumor in which, a few years ago, the mortality was 90 per cent within six months. Since we have used irradiation preoperatively and postoperatively, our last four patients are living and well, the longest survival being eleven years. Cystoscopy to view the bladder, retrograde pyelography to check both kidneys, x-ray of chest, spine and pelvis, and a good history and physical examination should help decide the method of management. Recystoscopy and pyelograms may be necessary at frequent intervals in some cases before a final decision can be reached. Nephrectomy alone was performed on thirty-nine cases; nephrectomy with x-ray preoperatively or postoperatively, or both, as indicated was done for twenty-seven cases; nephrectomy and ureterectomy was performed on thirteen cases; four cases had renal biopsy followed by deep x-ray therapy and twelve cases had deep x-ray therapy alone. Fifteen cases had only a cystoscopy and pyelographic examination. Eleven of these were hopeless, becoming moribund and expiring within from seven to fourteen days after they were first seen. One patient refused operation, one left the hospital and failed to return and one died of an acute cardiac attack a week after his arrival at the hospital.

Operative mortality included one case in 1916 dying of pneumonia seventeen days postoperatively, one case in 1922 dying in twenty-four hours of shock, two cases in 1932 dying in shock within twenty-four hours and one case in 1940 dying in shock in twenty-four hours. The five operative deaths give a 5.5 per cent overall operative mortality. However, it is only fair to state that since 1940, there has been no operative mortality on forty cases.

RESULTS

Among the forty-three hypernephromas encountered, there are thirteen cases alive without evidence of disease for varying periods. One has survived thirteen years and one seventeen years. There are twelve patients living but with recurrence or metastases. Two patients died from other causes, one of which had survived twenty years. Fourteen are dead from the disease and two could not be traced.

Among the thirty-four adenocarcinoma cases, ten are alive without evidence of disease, one of which has survived twelve years. Five are alive with recurrence or metastases. Two died from other causes and ten died of the disease and seven could not be traced.

Among the fourteen cases of carcinoma of the renal pelvis, there are five cases alive without evidence of disease and five cases alive with recurrence or metastases when last heard from. Four cases died of the disease and one could not be traced.

Among the eight cases of Wilm's tumors, four patients are alive and without evidence of disease, one of which has survived eleven years. Three died of the disease and one patient could not be traced.

The three patients with sarcoma died of the disease within three years.

Eight unclassified cases were not tabulated in this study.

The total survival was 30.3 per cent for three years; 22.5 per cent for five years; 8.8 per cent for ten years and 5 per cent lived longer than ten years.

CONCLUSIONS

1. Malignancy of the kidneys has one of the poorest prognoses of any of the urologic neoplasms.
2. The disease occurs most frequently in the sixth decade of life in both males and females.
3. Men are afflicted twice as often as women.
4. The left kidney was involved more often than the right in the ratio of 6 to 5.
5. Hypernephroma was the most frequently encountered neoplasm, occurring in 39.1 per cent of all cases.
6. The initial symptoms in the order of their frequency were hematuria 66.4 per cent, mass 49.1 per cent and pain 16.4 per cent.
7. Delay in seeking professional assistance after initial symptoms average 9.2 months.
8. Nephrectomy with postoperative deep x-ray therapy for hypernephromas and both preoperative and postoperative deep x-ray therapy for Wilm's tumor and nephro-ureterectomy for intrapelvic tumors are the methods of choice.
9. Survival for all cases is 30.3 per cent for three years; 22.5 per cent for five years; 8.8 per

cent for ten years, and 5 per cent for longer than ten years.

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NEEDLE BIOPSY OF THE LIVER IN THE DIAGNOSIS OF HEPATIC DISEASE

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THE CLINICAL DIAGNOSIS and prognosis of hepatic disease frequently are beset with uncertainty and inaccuracy. Despite the aid of numerous tests of hepatic function, patients with disease of the liver too often are subjected to needless laparotomy. The diagnosis of obscure liver disease often can be made by needle biopsy with a reasonable degree of safety.

Hepatic aspiration was used by Stanley[1] as far back as 1833 in hydatid disease and hepatic suppuration. It was first used as a diagnostic aid by Lucatello[2] in 1895, and was utilized by Bingle[3] in 1923 and Olivet[3] in 1926; but Lucatello's sections were unstained and inadequate tissue was obtained by Bingle and Olivet. The use of needle biopsy of the liver was first established as a real diagnostic aid in 1939 by Iverson and Roholm[4] in Denmark and Baron[5] in this country.

To the present time, there have been reported approximately 3,500 cases of needle biopsy of the liver. The major indication for needle biopsy is to distinguish between diffuse parenchymatous and extrahepatic obstructive jaundice, often a difficult differentiation even with complete clinical and laboratory data. Other important indications are: hepatomegaly of undetermined cause; diagnosis of infiltrative lesions such as malignancy, primary or secondary; amyloidosis or cirrhosis, and to determine progress of therapy in liver disease.

Needle biopsy of the liver is a bedside procedure, all methods employing local infiltration of procaine hydrochloride as the anesthetic. All procedures utilize cutting needle, aspiration, or a combination of both in obtaining a plug of liver tissue. In

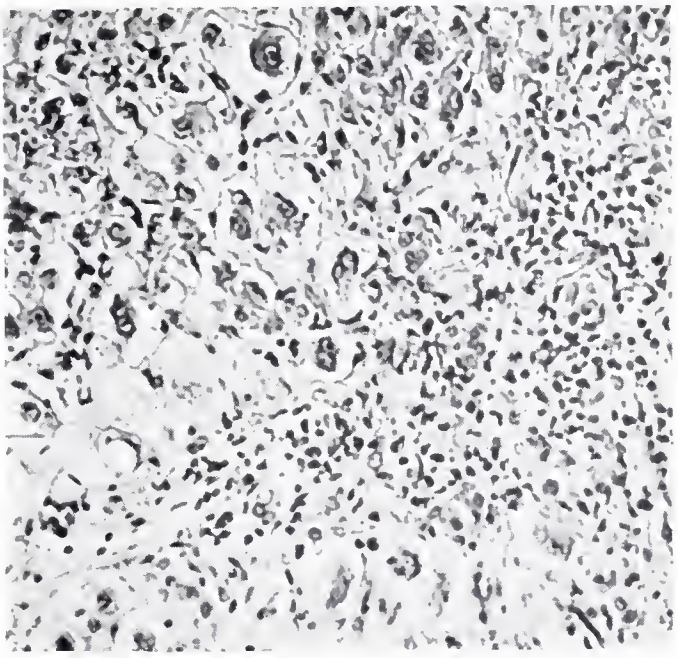


Fig. 1. Viral hepatitis (case 9). Heavy infiltration of the portal fields with inflammatory cells. In many of the hepatic cells the cystoplasm is swollen and granular ("balloon cells").[6, 9] In many cells the nuclei are pyknotic or have disappeared. The hepatic lobule is infiltrated with moderate numbers of inflammatory cells.

cases of hepatomegaly, the anterior abdominal approach to the right of the midline subcostally is probably the safest.[5, 9] In cases in which the liver is not enlarged, or in cases in which the liver is not well defined, the intercostal approach may be used.[4, 7] Cogswell[6] reports 328 successful intercostal biopsies, and Sherlock [7, 8] reports 450 such biopsies.

Possible complications include: (1) pain, localized or diaphragmatic, usually easily controlled by salicylates, (2) damage to surrounding organs, (3) infection, (4) hemorrhage.

The procedure is limited to hospital patients who have had complete workup, including careful study of prothrombin activity. Prolonged prothrombin time which cannot be brought to safe levels by vitamin K constitutes the major contraindication to this procedure. The other contraindications are: (1) presence of pyogenic infection of the liver and (2) increased bleeding tendency.

The series reported includes nineteen cases taken from the University of Kansas Medical Center, Kansas City, Kansas, and Menorah Hospital, Kansas City, Missouri. The Vim-Silverman needle as originally reported by Tripoli and Fader[9] was used in all cases. After infiltration with procaine, the outer needle is passed into the liver, the stylet is removed and the inner split needle inserted without rotation. The outer needle is advanced on

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NO.	AGE	SEX	HISTORY	PHYSICAL FINDINGS	LABORATORY	BIOPSY	CLINICAL IMPRESSION	COMMENT
1	65	M	RUQ pain after meals 6 mo. Ankles swollen 1 mo. Jaundice with clay stools and dark urine several days. Progressive weakness Anorexia and abdominal distension. Chronic alcohholic.	Marked abdominal distension. Distended superficial veins. Spider nevi. Nodular liver down 10 cm. Fetor hepaticus.	I.I. 30. T.T. 5 U. Ceph. Flocc. 1 plus Alk. P'tase 16 U.	Cirrhosis and hepatoma	Cirrhosis	Died-autopsy confirmed biopsy
2	65	M	Weakness, nausea, vomiting and pain in RUQ, 3 wks. 45 lb. wt. loss in 2 mo. Eye removed 2½ yrs. previously. Report: Probable malignant melanoma.	Liver down 4 cm., tender. Left eye absent.	Alb. 4.1; Glob. 2.6 Amylase 66 U. X-rays negative.	Metastatic amelanotic melanoma	Hepatomegaly, cause undetermined	
3	5 wks.	F	Liver enlarged since 7 days of age. Gradual enlargement of abdomen.	Distended abdomen. No lymphadenopathy. Large mass with sharp edge occupying entire abdomen, believed to be liver.	Histoplasm and tuberculin skin tests neg. I.I. 6 U. Other liver tests normal.	Neuroblastoma	Neuroblastoma	Liver biopsy after X-ray therapy: Normal liver.
4	34	F	Jaundice 1 mo. Nausea and vomiting 2 mo. Abdominal pain and distension and listlessness 1 wk. Deficient diet and excessive alcohol.	Comatose. Icteric. Distended abdomen. Liver down 4 cm. Spider nevi.	WBC 26,450. PMN'S 90% I.I. 34 U. T.T. 20 U. Ceph. Flocc. 4 plus. Alb. 2.; Glob. 2.5.	Acute hepatitis and early cirrhosis	Cirrhosis.	Clinical recovery with therapy
5	47	M	Weak and lethargic 6 mo. Edema of ankles 3 mo. Jaundice, nausea, vomiting and distension of abdomen 2 wks.	Jaundice, ascites, hemorrhoids, spider nevi. Liver not palpable.	I.I. 43 U. Serum bil. 4 mg% Ceph. Flocc. 4 plus Chol. 300; Est. 150. Prothrombin 30% X-ray: Varices of esophagus?	Hemochromatosis	Cirrhosis Hepatoma?	Died-no autopsy
6	45	M	Pruritis, weakness, jaundice 5 mo. Onset with nausea and vomiting. 40 lbs. wt. loss.	Acutely ill, dehydrated and emaciated. Liver down 3 cm. and tender.	I.I. 80 U. T.T. 4 U. Serum bil. T 27.6, 1' 10. Ceph. Flocc. 1 plus Ur. Urobil. 5 U. Gall bladder: no concentration.	Obstructive Jaundice	Hepatitis	Surg: Hodgkins Post: Hodgkins
7	27	M	Recurrent chills, fever, and diarrhea 3 yrs. Liver enlargement and jaundice 1 yr. Ascites 4 mo. Ulcerative colitis 10 yrs. previous.	Jaundice, ascites, hepatomegaly, splenomegaly, spider nevi.	WBC 13,000. I.I. 5 U. T.T. 6 U. Chol. 315; Est. 126 Alb. 3.6; Glob. 3.7 Prothrombin 60% X-ray of GI neg.	Acute and chronic periportal hepatitis	Cirrhosis Malignancy?	
8	45	M	Old alcoholic. Ascites and wt. loss 3 yrs. Dyspnea.	Spider nevi, ascites, peripheral edema	WBC 8,400 I.I. 1 U. T.T. 8 U. Ceph. Flocc. 2 plus Chol. 270; Est. 189 Alb. 1.9; Glob. 3.0 Prothrombin 80%	Portal cirrhosis	Portal cirrhosis	Subsequent splenorenal shunt.
9	43	F	Mass in RUQ 1 yr. Arthralgia. myalgeia, dark urine 3 wk.	Jaundice, palpable, moveable mass believed to be rt. kidney. Liver down 5 cm.	WBC 5,000; 35 segs, 12 stabs, 46 lymphs. I.I. 50-70 U. Ceph. Flocc. 4 plus Alk. P'tase 4 U. Chol. 164: Est. 46 Repeat Chol. 136; Est. 21 Alb. 3.5; Glob. 2.8	Severe acute hepatitis	Med. Dept. Acute hepatitis Surg. Dept: Extra hepatic biliary obstruction secondary to tumor.	Surgery not performed. Stormy course with severe hepatic disease. Final return of all tests to normal. X-ray: Benign cyst or neoplasm rt. kidney.
10	64	M	Spiking fever to 103-104. Recurrent chills, fever, jaundice, dark urine, light stools 4 yrs.	Palpable liver. Jaundice.	I.I. 25-90 U. Ceph. Flocc. 2-3 plus Alk. P'tase 12 U. Chol. 103; Est. 26 Alb. 3.3; Glob. 2.2 Prothrombin 100% Gall bladder: no concentration	Obstructive jaundice	Obstructive jaundice vs. hepatitis.	Edema hepatoduodenal lig, thickened dilated common duct, wedge biopsy showed similar picture to needle biopsy Autopsy similar picture.

NO.	AGE	SEX	HISTORY	PHYSICAL FINDINGS	LABORATORY	BIOPSY	CLINICAL IMPRESSION	COMMENT
11	42	M	Vomiting and diarrhea 2 mo., rapidly developing ascites and edema 2 wks. Thrombosis left femoral vein 4 yrs. previously.	Jaundice. Spider nevi. Distended abdomen. Fluid wave. Liver down 7 cm. Prominent superficial veins over abdomen and thighs. Spleen palpable.	WBC 11,600. Ceph. Flocc. 1 plus Chol. 290; Est. 101 Alb. 3.1; Glob. 2.2	Active Hepatitis. Fatty changes and early cirrhosis	Cirrhosis vs. portal vein thrombosis.	Massive hematemesis leading to death. Autopsy: Hepatitis acute and chronic, fatty liver, early portal cirrhosis. Esophageal varices.
12	66	M	Jaundice, anorexia, clay colored stools, dark urine, with no chills, fever or pain 3 days. Episode of jaundice lasting 1 wk., 2 yrs. previous	Jaundice. Tender liver down 5 cm.	WBC 5,000; 57 segs. 8 stabs, 35 lymphs. I.I. 24 U. Chol. 245; Est. 87. Alb. 3.2; Glob. 3.1 Alk. P'tase 20 U. Prothrombin 26% rose to 88% with parenteral vit. K.	Obstructive jaundice	Chronic hepatitis	Surgery revealed dilated gall bladder and dilated common duct with many stones in the gall bladder and common duct.
13	49	F	Progressive painless jaundice with pruritis and ecchymoses 2 wks.	Jaundice. Linear excoriations. Liver not palpable. Dullness down 4 cm. in RUQ.	WBC 10,700. I.I. 60 U. Ceph. Flocc. neg. Alk. P'tase 8.5 U. X-ray: Displacement of duodenum-differential between CA head of pancreas and CA of gall bladder.	Obstructive jaundice	CA head of pancreas vs. hepatitis	Surg. biopsy: fibrosing pancreatitis. Autopsy: CA head of pancreas growing into common bile duct.
14	39	F	RUQ pain, light stools, low grade spiking fever. No urinary tract complaints.	Tenderness RUQ and right costovertebral angle.	WBC 7,600. I.I. 5 U. Urine negative. X-ray: IV pyelogram—blunting of calyces?	Changes not those of primary liver disease	Atypical hepatitis? Urinary tract infection? Cholecystitis?	Exploratory laparotomy: Liver and gall bladder normal. Subsequently pyuria and A. aeragones cultured from urine.
15	69	M	Edema of legs, jaundice, and light stools 2 mo. Deficient diet and excessive alcoholic intake, 3 yrs.	Jaundice. Liver edge down 7 cm. Spleen palpable. 3-4 plus edema of lower extremities.	WBC 5,700. I.I. 25 U. Ceph. Flocc. 4 plus Chol. 169; Est. 67. Alb. 2.6; Glob. 2.9.	Portal cirrhosis	Cirrhosis and hepatitis	Improvement with low Na Patek diet, Choline and mercurial dieretics.
16	67	F	Hematemesis and tarry stools 2 days Ankle edema 1 mo. Hepato and splenomegaly 1 yr. Ascites during hospitalization.	Liver edge down 5 cm. Spleen palpable 90/60.	Hb. 40%. RBC 2.49. WBC 7,400 I.I. 3 U. X-ray suggestive of esophageal varices.	Suggestive of portal cirrhosis.	Ruptured esophageal varices and cirrhosis.	Patient responded well to routine treatment of hemorrhage and cirrhosis.
17	43	F	Nausea, vomiting, jaundice 2 wks. Clay colored stools, dark urine. History of immunizations given 2-3 mo. before.	Jaundice. Liver down 3 cm. and tender.	I.I. 100 U. T.T. 27 U. Serum bil. T 14.7, 1' 8.2 Ceph. Flocc. 4 plus. Alk. P'tase 18 U. Chol. 153; Est. 55. Alb. 3.4; Glog. 3.9. Ur. urobil. 25 U.	Active hepatitis	Hepatitis Possible obstructive jaundice.	Clinical and lab improvement with bed rest and Patek diet.
18	62	F	Headache, pain in neck, loss of appetite, nausea 2 wks. Jaundice and light colored stools 3 days. Mild itching.	Jaundice. Mild liver enlargement and tenderness.	WBC 8,400. I.I. 65 U. T.T. 36 U. Serum bil. T 15, 1' 9. Ceph. Flocc. 4 plus Alk. P'tase 7.8 U. Chol. 164; Est. 65 Ur. Urobil. originally low with sudden rise to 100 mg/24 hrs. Prothrombin 45% with slow vit. K. response	Hepatitis	Hepatitis	Clinical and lab improvement with bed rest and Patek diet.
19	57	M	Diarrhea 5 wks. Progressive jaundice with light stools and dark urine 3 wks. Intense pruritis. 5 lb. wt. loss.	Jaundice. Liver down 5 cm., not tender. Linear excoriations.	I.I. 100 U. Serum bil. T. 14 1' 7 Ceph. Flocc. 4 plus Alk. P'tase 15 U. Chol. 147; Est. 46. Alb. 3.2; Glob. 2.6 F. Urobil. 2.4 and 4.8 mg/100 gm of stool. No bile in duodenal drainage.	Consistent with cirrhosis and obstruction of biliary tree	Extra hepatic biliary obstruction and diffuse liver damage.	Carcinoma of gall bladder with stricture of common bile duct found at surgery.

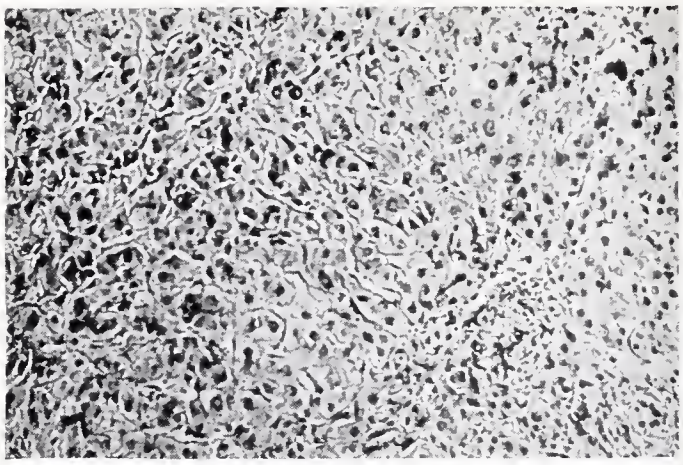


Fig. 2. Obstructive jaundice (case 19). The majority of hepatic cells are free of significant changes and the lobular architecture is well preserved. The most striking change is dilatation of bile canaliculi and plugging with "bile thrombi."

the inner, acting as a cutting edge, trapping tissue within the two prongs of the inner needle. The whole procedure takes from two to five minutes. In six cases, the anterior approach was used, the remainder being approached transpleurally. Mild local or referred pain was the only complication encountered. The diagnosis was confirmed by subsequent operation, or autopsy in ten cases.

DISCUSSION

The present day understanding of epidemic hepatitis and serum hepatitis is due in large part

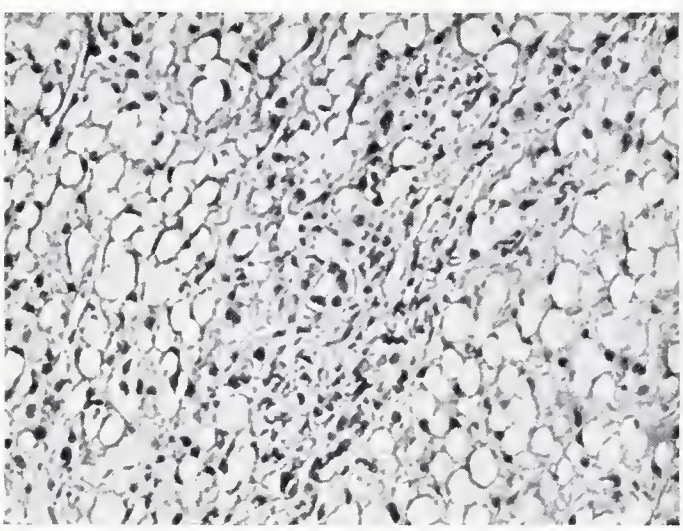


Fig. 3. Fatty metamorphysis and hepatitis (case 11). Note widening of the portal field with heavy cellular infiltration and fibrosis. Conspicuous fatty changes are present in the hepatic lobules.

to information gained by needle biopsy. Iverson and Roholm[4] initiated studies which have clarified understanding of the pathology of the diseases named. All of the available laboratory tests of liver function are limited in that they are only a measure of impaired function and do not indicate whether the impaired function is due to hepatitis, malignancy, cirrhosis or other conditions.[10, 11, 12, 15, 16] Exact diagnosis of liver disease is therefore difficult on the basis of liver function tests alone. It is usually simple and of great aid to do a liver biopsy, often establishing an exact pathologic diagnosis, regardless of function tests.

Liver biopsy has its greatest clinical value in the distinction between jaundice due to parenchymatous inflammatory change (i.e. hepatitis) and jaundice due to obstruction of the biliary tree (i.e. extrahepatic obstruction due to stone, malignancy).[13, 14, 16] In the ninth case (fig. 1) reported in this series, the surgical department favored a diagnosis of extrahepatic obstructive jaundice because of a palpable abdominal mass and had sched-

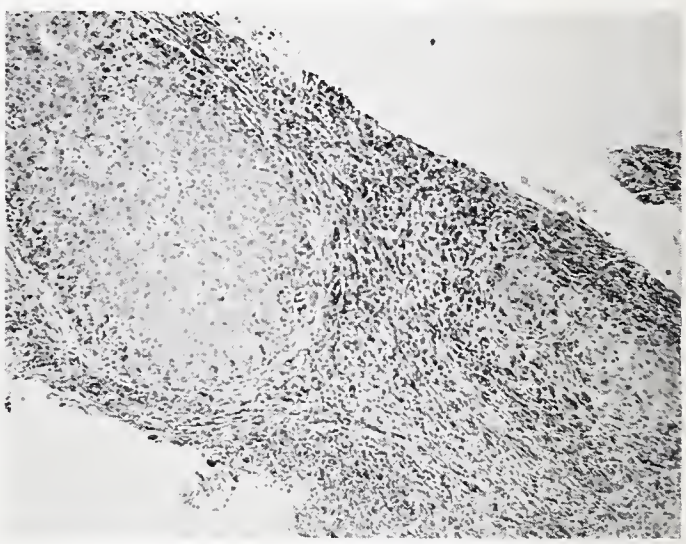


Fig. 4. Portal cirrhosis (case 5). Note the formation of two small nodules of hepatic cells without central vein and portal triad relationships. The nodules are separated by broad bands of dense fibrosis.

uled operation at the time the needle biopsy was done. The biopsy revealed an acute infectious hepatitis and the operation was not done. The patient finally recovered completely after a stormy illness; the insult of laparotomy could well have been a lethal procedure to this patient. In six of the reported cases (cases 9, 12, 13, 17, 18, 19) needle biopsy made the differentiation between extrahepatic biliary obstruction and hepatitis. In half of these cases the diagnosis, before biopsy, was problematic in spite of the number of function

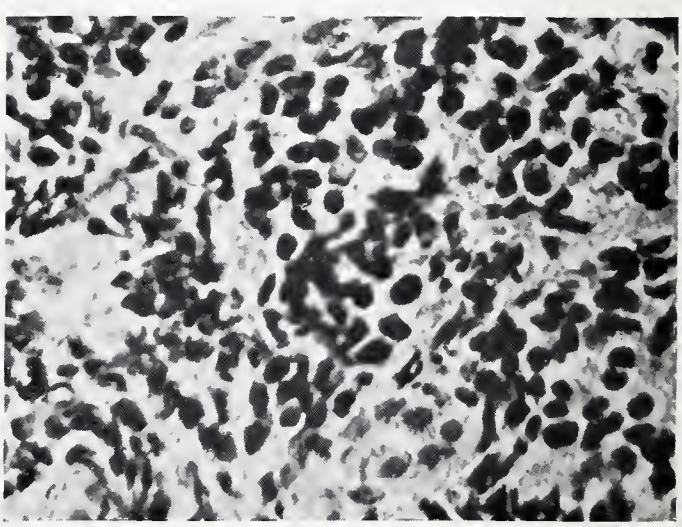


Fig. 5. Metastatic neuroblastoma (case 3). The normal liver cells are almost completely replaced by clumps of dark staining tumor cells.

tests employed (fig. 2). In four of the presented cases (cases 1, 2, 3, 5) needle biopsy established diagnosis which could only be made antemortem by biopsy or laparotomy. These were cases of hepatoma, metastatic melanoma, neuroblastoma (fig. 5) and hemachromatosis. In only one of these cases, that of neuroblastoma, was the diagnosis even considered before biopsy.

Seven cases of hepatic cirrhosis (cases 4, 5, 11, 13, 15, 16. 19) are included in this series (figs. 3 and 4), one biliary, one pigmentary, and five portal cirrhosis. The clinical diagnosis was correct in five of these seven cases, the other two being mistaken for hepatitis. Liver biopsy has an added role in estimating the prognosis in patients with cirrhosis and in evaluating the therapeutic program by taking serial biopsies after periods of therapy.[18, 19]

In one case reported (case 14), needle biopsy ruled out diffuse hepatic disease in which hepatitis was one of the clinical impressions. The impression of the surgical consultant was cholecystitis. The patient ultimately was found to have renal disease, accounting for symptoms and findings.

There was no appreciable bleeding in any of these patients following biopsy; none required transfusion. The patients suffered little, if any, discomfort following biopsy, a few having slight pains in the right upper quadrant and referred to the right shoulder for a few hours after biopsy. No fever, leukocytosis or other complications occurred in any of these patients.

SUMMARY

Needle biopsy of the liver has proved to be a valuable aid in the diagnosis of obscure liver disease. It is of greatest value in the differential diagnosis of jaundice due to viral hepatitis, hepatic cirrhosis, extrahepatic biliary tract obstruction and malignant neoplasm of the liver.

Nineteen cases are presented, in all of which needle biopsy was of real diagnostic value. Biopsy was not carried out in cases with pyogenic liver infection, increased bleeding tendency or lengthened prothrombin time. No complications of note were encountered in any of these cases.

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MOUTH HAND SYNKINESIS

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MOUTH HAND SYNKINESIS is an associated movement which is phylogenetically inherited and can be elicited in about 80 per cent of children under the age of 7 years. It may be elicited by directing the child to open his mouth. Abduction of the thumb and fingers follows by association. The reaction is usually bilateral. If the child is standing and makes a great effort, when asked to open his mouth, extension of the wrists may occur in addition to the reaction of the hand. Occasionally a child may respond also by extension of the spine and extension at the ankle joints. The usual reaction to opening the mouth is limited to abduction of the thumb and spreading of the fingers.

It has been recorded that the sign's presence under the age of 7 years denotes a healthy child. Likewise, failure to elicit a response is sometimes considered normal.[1] Conversely, other normally present associated movements, such as swinging of the arms, may disappear in disease processes such as chorea minor or in the Parkinson syndrome. The reappearance of mouth hand synkinesis after it has normally disappeared, or the development of other independent associated movements, is of pathologic significance and may follow such conditions as brain trauma, meningitis or encephalitis.

A study was undertaken to determine the incidence of this associated movement in normal children between the ages of 3 and 12 years. Also, the presence or absence of mouth hand synkinesis was determined in sick children hospitalized with the various illnesses of a general pediatric ward. One hundred seventy-three normal children and 146 sick children were examined.

It can be seen that the largest number of positive reactions (80 per cent) falls within the first 7 years (fig. 1). After the seventh year, a definite fall in the number of positive reactions is noted. Since the group of ill children was not selected

but taken with all conditions, there is only a slight reduction of the positive reactions (78 per cent). Acute severe illness, such as pneumonia, accounted for the major reductions. Of six children in the 3 to 7 year period exhibiting a negative initial response, five showed a positive result after recovery.

Sex differences were not significant but the number of cases examined was insufficient to draw definite conclusions.

One 15 year old child who was recovering from a left hemiplegia exhibited a positive sign on the left. He was not included in the totals. Mixed reactions were uncommon (2 per cent of all cases).

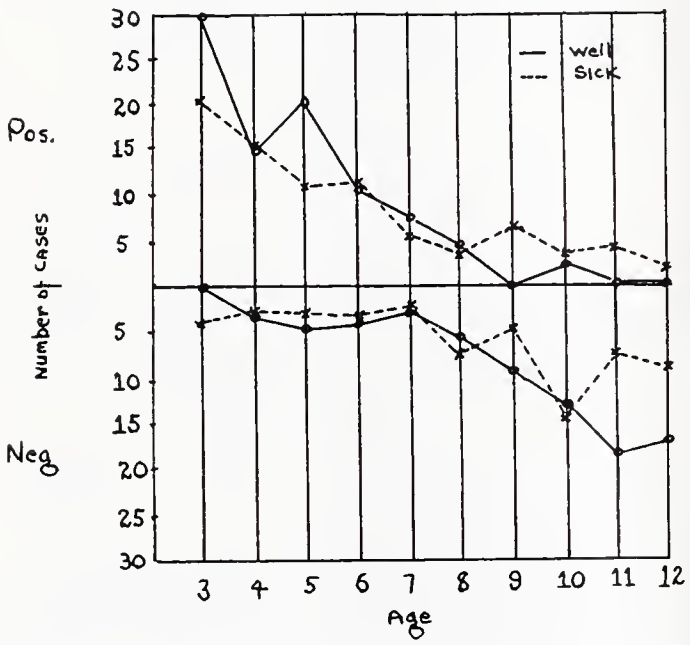


Fig. 1.

One could usually elicit a bilateral sign if the child's hands were lightly held and motion in the thumb or fingers recorded

DISCUSSION

Zahorsky[1] first described this synkinesis in 1924. He credited a colleague, Saunders, as being the first to note its presence in children. Zahorsky stated that it was usually not seen after the age of 12 years. He used it as a clinical aid in differentiating tic from chorea. In chorea its presence was described as weak and jerky.

Other observers have recorded it.[2,3,4] Comin[4] observed its presence in children from 3½ to 7 years of age. He felt that persistence after the 8 to 9 year age was abnormal and could be associated with neuropathic diathesis, latent and active tetany, infantile cerebral paralysis and meningitis.

In Schacter's cases,[3] 80 per cent were positive up to the age of puberty and 16 per cent thereafter. Seventy-seven per cent of all children examined between the ages of 3 and 16 exhibited this sign. He felt that persistence beyond puberty might indicate a psychomotor retardation. He could not associate its presence after puberty with mental retardation, nor was there any degree of association with the presence of a positive Chovostek's sign.

Many other types of associated movements have been described throughout the literature, many occurring after or associated with neurologic illness (encephalitis,[5] meningitis[3]). Heredito-familial association [6,7] is recorded as well as synkinetic nystagmus and the ocular synkinetic varieties. Physiologic differences between teneric and acquired associated movements have been explored.[9]

Consideration of the cause of the presence or absence of mouth hand synkinesis must include at least two factors: (1) the close association of the mouth hand centers in the precentral area 4 (area pyramidalis) of the cerebral cortex; (2) the lack of, or presence of, myelinization of the fibers in this area 4.

The centers of the hand and mouth are anatomically close and stimuli provoking a maximum response of mouth opening could easily, by spread innervation, provoke a response in the hand. Lyons[10] has directed attention to the frequent association of lip puckering and skilled movements of the hand. All have seen the child who opens his mouth and partly protrudes his tongue when concentrating on such acts as drawing or sewing.

Myelinization, or insulation, in this reference, is complete only after puberty. Overflow innervation in the absence of myelinization or incomplete myelinization may allow a spread. The differentiation of Betz cells in the precentral area increases with brain growth and response to stimulation is partly dependent upon their number. Since all studies were carried out in patients after infancy this point is not significant. As myelinization becomes more and more complete and affords greater insulation it could be expected that this associated movement would gradually disappear. The results of differentiation, development and myelinization, a phylogenetic pattern, produce a non-reactor in the normal adult.

Processes which interfere with these mechanisms may cause changes which provoke aberrant responses. If one mentions heredito-familial possibilities but considers only acquired cause for change, then any condition which favors spread innervation is likely to give a response. Likewise, factors interfering with innervation could produce negative results.

Sepsis, pneumonia and other severe infections associated with rapid intoxication and changes in the body chemistry in the 3 to 7 year period are possible causes of interference with spread innervation. Chronic ailments by general somatic depression could account for a negative result. In such cases, with the advent of recovery, and having had the sign previously demonstrated, one would expect a return of the sign. This is the usual result.

If the sign has disappeared normally as in the 7 to 12 year group, and reappears associated with or following central nervous system disease, primary or secondary, it can be assumed that factors

favoring spread of innervation have pathologically become manifest.

SUMMARY

1. Eighty per cent of normal children between the ages 3 and 7 years showed mouth hand synkinesis.

2. Seventy-eight per cent of ill hospitalized children (non-selected) presented mouth hand synkinesis.

3. The probable mechanism of action of this synkinesis is discussed and factors affecting its appearance or disappearance mentioned.

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DIGITALIS: A REVIEW

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WENKEBACH[1] STATED forty years ago, "The administration of digitalis demands a great deal of skill, power of observation, keen interest and experience; a long life is too short to learn enough about this wonderful drug." This statement is all the more true now that the problem has been complicated by the isolation and purification of the cardiac glycosides found in digitalis purpurea, digitalis lanata, squill and strophanthus. To add to the confusion, the various preparations have been given special trade names and have different dosages for oral and parenteral use. It is the purpose of this review to clarify the issues by reviewing the fundamental pharmacologic and physiologic actions of digitalis.

HISTORY[2, 3]

A large number of plant extracts containing cardiac glycosides have been used by natives in various parts of the world as arrow and ordeal poisons. Squill was known as a medicine to the ancient Egyptians and the Romans employed it as a diuretic, heart tonic, emetic and rat poison. Foxglove was mentioned in 1250 A.D. in the writings of Welsh physicians, and was described botanically 300 years later by Fuchsius (1542) who gave it the name digitalis purpurea because the flower was purple and resembled a finger.

The modern use of digitalis in medicine stems from William Withering, who learned of the herb remedy from an old woman in Shropshire, and demonstrated its usefulness in the treatment of dropsy. He recorded the benefits to be obtained from the proper use of foxglove and warned about its toxic effects,[5] but his advice was not always heeded. During the nineteenth century digitalis was used indiscriminately, often in toxic doses, for many disorders. During the early twentieth century, as a result of the work of Cushny, MacKenzie, Lewis and others, the drug gradually came to be used as a specific in auricular fibrillation. Within the last thirty years it has become established that the main value of digitalis is in the treatment of cardiac failure.

CHEMISTRY[2,3]

The active constituents of digitalis purpurea and digitalis lanata are glycosides. The glycosides represent the combination of an aglycone or genin with one or more molecules of sugar. The pharmacologic activity resides in the aglycone. The sugar to which the aglycone is attached is believed to influence water solubility, cell permeability and persistence of cardiac action, and hence the therapeutic potency of the molecule. When given alone, the sugar is inactive, but when linked to aglycones the potency and toxicity of the latter are increased several fold.

The sugars are monosaccharides. While some of them, such as glucose and rhamnose, are well known, others, such as digitoxose and digitalose, are unusual pentose sugars found only in digitalis principles.

The glycosides of digitalis purpurea and digitalis lanata are similar in composition and in their qualitative pharmacologic responses.

Digitalis Purpurea Native Glycosides	Glycosides	Digitalis Lanata Native Glycosides
Deacetyldigilanid A	→Digitoxin ←Digilanid A	(lanatoside A)
Deacetyldigilanid B	→Gitoxin ←Digilanid B	(lanatoside B)
? Glycoside	→Gitalin	
	Digoxin ←Digilanid C	(lanatoside C)

The glycosides of digitalis behave chemically as do all other glycosidal structures, decomposing on hydrolysis into their aglycones or genins and splitting off their sugar molecules. The aglycones are related in their chemical configuration to the bile acids, cholesterol, sterols and sex hormones, the basic structure being the cyclopentanophenanthrene nucleus to which is attached a lactone ring.

Deacetyldigilanid A, one of the native glycosides of digitalis purpurea, when hydrolyzed, loses a molecule of glucose and becomes digitoxin. Digitoxin in turn can be hydrolyzed to yield three molecules of digitoxose plus digitoxigenin, which is the genin or aglycone.

1. Deacetyldigilanid A $\longrightarrow$ Digitoxin + Glucose
2. Digitoxin $\longrightarrow$ 3 Digitoxose + Digitoxigenin

The structural formula for digitoxigen is shown in figure 1.

Presented before the St. Louis City Hospital Journal Club, St. Louis, May 15, 1950.

The principal cardiotonic genins differ from each other by the stereochemical relationships of the ring structures and in the number of OH groups attached to the rings. These changes, however, modify the cardiotonic action in degree only. Essentially, the effects of the various glycosides are similar.

PHARMACOLOGY

From digitalis purpurea, the U. S. Pharmacopoeia recognizes only digitoxin. Digitalis lanata is not recognized but its native glycoside, lanatoside C, is, as well as digoxin, which is derived from lanatoside C.

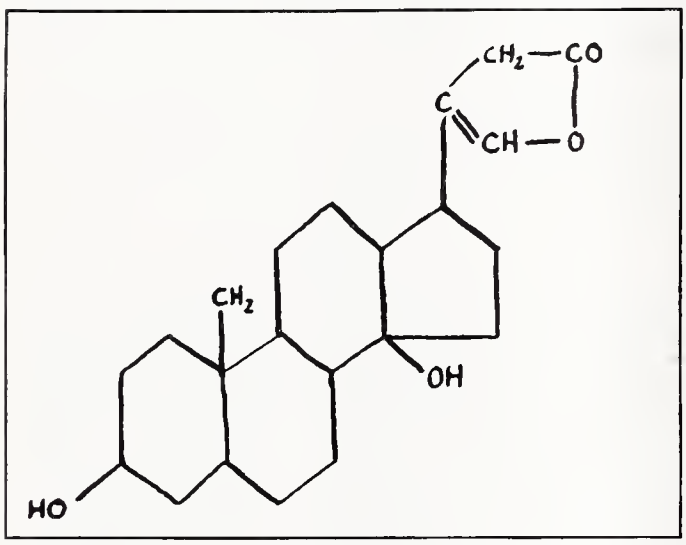


Fig. 1.

Digitalis exerts its pharmacologic effects chiefly on the cardiovascular system. The study of the actions of digitalis has been rendered difficult by the interrelations of the cardiovascular functions and also by the fact that little is now known of how digitalis basically affects heart muscle. However, cardiac catherterization studies have thrown new light on the circulatory dynamics of heart failure and biochemical research is gradually revealing how digitalis influences myocardial function. These studies are not conclusive but apparently the glycosides enter the cell protoplasm and there release the active aglycones,[6] changing molecular and ionic concentrations. They have been linked with the metabolism of cholesterol,[7] creatinine[8] and potassium.[9].

Digitalis exerts profound effects on the cardiovascular system, predominantly by direct action on the myocardium. Older experimental work, as well as later data obtained by cardiac catheterization, indicates that it is no longer necessary to introduce extracardiac or vagal actions of digitalis to account for its effect in heart failure.

Digitalis increases the force of systolic contractions. This has been demonstrated directly by Cattell and Gold[10] and by Kobat and Visscher[11] who showed an increase in the tension of animal heart muscle following the administration of cardiotonic glycosides. Apparently digitalis also increases the mechanical efficiency of the heart, allowing it to do a given amount of work with less consumption of oxygen.[12] By increasing the force of systolic contraction in the failing heart, digitalis brings about a reversal in the changes in pathologic physiology. The ventrical empties more completely, the heart becomes capable of receiving the increased venous return, and the venous pressure thereby is lowered. Not only is systole strengthened, but it is shortened, allowing more time for the heart muscle to rest and for the ventricle to fill.[2]

Heart Rate.—Digitalis causes a slowing of cardiac rate by virtue of its beneficial effect on myocardial function.[13] In normal hearts digitalis in therapeutic doses brings about slight or no slowing. In patients with congestive heart failure, decompensation may be relieved without slowing of the heart.

Vagal stimulation may play a role in cardiac slowing for such slowing can be diminished by vagotomy or large doses of atropine.[14] However, there is evidence that this vagal reflex originates in the myocardium when its function is improved by digitalis.[13]

Atrioventricular conduction is slowed by clinical doses of digitalis[2] as shown by prolongation of the PR interval. This effect may be partly vagal in origin, but it is mainly a direct action of the drug on the conduction bundle.[15] Mere prolongation of A-V conduction time will have no effect on cardiac rate if the rhythm is regular. However, it may play a part in cardiac slowing when auricular fibrillation or flutter are present. According to Luten and Jeffreys[13] the effect of digitalis on atrioventricular conduction is of secondary importance in accounting for myocardial improvement in cases of auricular fibrillation and heart failure. Clinical improvement can be explained by direct action of digitalis on the myocardium producing stronger cardiac contractions.

Heart Size.—Digitalis decreases the size of the heart in the heart-lung preparation in normal animals, in normal persons and in patients with congestive heart failure.[16,4] The direct action of the drug on the heart muscle probably accounts for the decrease in the diastolic size of the heart.

Cardiac Output.—Digitalis decreases the cardiac output in normal animals and man through reduction of the heart size by the cardiotonic action of the drug.[16] By means of cardiac catheterization studies, Stead,[17] Harvey[18] and Ferrer[19] have shown an almost constant increase in the cardiac output in cases of heart failure following the use of digitalis.

Venous Pressure.—The venous pressure, if elevated in patients with heart failure, is lowered.[17,18,19] Most observers believe the decrease in venous congestion to be secondary to the improvement which occurs in the circulation and especially to the increased cardiac output. In patients with isolated left ventricular failure and normal venous pressure, digitalis has no significant effect on the venous pressure.[18]

Some workers (Dock and Tainter,[20] McMichael and Sharpey-Schaffer[21, 33]), maintain that the pri-

mary action of digitalis is to lower the venous pressure, thus, by relieving the increased load on the failing heart, allowing it to recover its efficiency. From experiments on the dog, Dock and Tainter[20] concluded that the site of action of therapeutic doses of digitalis is the peripheral vessels, particularly those of the liver. By constriction of the smooth muscle of the hepatic vein, digitalis is said to bring about a pooling of blood in the liver and portal system, relieving the congestion on the right side of the heart and allowing improvement in cardiac function. McMichael and Sharpey-Schaffer[21,33] also believe that digitalis exerts a venoconstrictor action in heart failure, pointing out that the increase in cardiac output and fall in venous pressure closely mirror the changes produced by venesection or the application of tourniquets.

Goodman and Gilman[2] have summarized the arguments against this interpretation. First, according to most observers, heart failure is the cause rather than the result of increased venous pressure. Secondly, the venous pressure in congestive heart failure is insufficient to be a factor in stretching of the right ventricle. Third, in isolated left ventricular failure digitalis causes restoration of compensation without significant changes in venous pressure. Fourth, digitalis causes a decrease in the size of the swollen liver in congestive failure rather than an increase which would be necessary according to this theory. Lastly, there is insufficient smooth muscle in the hepatic veins of man to perform a sphincter function though it may do so in the dog.

Ferrer and her associates[19] present additional evidence to support the view of a direct myocardial action of digitalis. Through cardiac catheterization studies on a patient with tricuspid insufficiency and cardiac failure, they found an increase in cardiac output without any change in the elevated venous pressure. In the absence of a fall in venous pressure, they concluded that a venodilator action of digitalis is unlikely. They suggest that since a venous action of digitalis, which was suggested by McMichael, has not been substantiated in studies on patients with left ventricular failure and patients with tricuspid insufficiency, it would appear more reasonable to postulate a drug action that is uniform in all patients with cardiac failure. "The concept that the primary action of digitalis is upon the myocardium permits adequate explanation of the effects of the drug in all types of cardiac failure."[19]

Coronary Circulation.—Agreement is not uniform as to the effects of digitalis on the coronary blood flow. Therapeutic doses have been reported to cause coronary vasoconstriction,[22] and digitalis has been said to increase the frequency of attacks in patients with angina pectoris.[23] However, Herrick and Visscher,[24] using the thermostrometric method to test the mean blood flow through the left coronary artery in trained unanesthetized dogs, found that digitalis has no effect on coronary blood flow. Furthermore, Gold's[25] controlled study of 120 patients with angina pectoris failed to show that digitalis causes cardiac pain. Goodman and Gilman[2] conclude that in patients with heart failure the blood supply to the myocardium may actually be improved as a result of digitalis induced restoration of cardiac compensation.

Electrocardiographic Effects.—Goldberger[26] has outlined the main effects of digitalis on the electrocardiogram. One of the most constant effects is a shortening of the Q-T interval. This usually is accompanied by changes in the shape and direction of the RST and T waves, which tend to point in a direction opposite to that of the QRS complex after digitalization. This can be explained as follows: in a normal person the muscle fibers in different regions of the ventricles remain in a stimulated (apolarized) state for different periods of time. This causes the heart muscle to return to the resting state in a different order from that in which it was stimulated and the RST and T waves point in the same direction in most leads. When the Q-T interval shortens and the ventricles return to a resting state in a shorter time, those regions that are normally slow to return to the resting state are more greatly affected than those regions that return to the resting state quickly. In other words, the duration of the stimulated state becomes equal in all regions of the ventricle, the muscle returns to the resting state in the same order as it was stimulated, and the RST segment and T wave tend to point in a direction opposite to that of the QRS complex. Digitalis does not change the direction of the T waves in the pattern of myocardial infarction.

THERAPEUTIC INDICATIONS

There is fairly general agreement on the indications for digitalis therapy.[3, 4, 27, 28] The principle ones are:[4]

1. Congestive heart failure.
2. Auricular fibrillation, especially when the ventricular rate is rapid and congestive heart failure is present.
3. Auricular flutter.
4. Prevention and treatment of paroxysmal auricular tachycardia.

Congestive Heart Failure.—The primary indication for the use of digitalis is congestive heart failure.[3, 4, 27, 28] Digitalis is indicated whether heart failure is mild or severe, whether the rhythm is regular or irregular, and whether or not heart block (unrelated to digitalis) is present.

Goodman and Gilman[2] stress the fact that digitalis is useful in cardiac decompensation regardless of whether the failure is of the right or left ventricle, or both. The type of rhythm exhibited by the decompensated heart neither indicates nor contraindicates the use of digitalis, and the same holds true for valvular defects, though these factors may modify the response to the drug.

The most dramatic effects of digitalis are observed in patients with heart failure associated

with auricular fibrillation, especially when the rate is so rapid that it impairs ventricular filling and cuts into the recovery phase of diastole. Digitalis should be administered to patients with heart failure and auricular fibrillation even though the ventricular rate is not rapid, since the essential purpose of digitalis therapy in heart failure is the improvement of myocardial function and not slowing of the cardiac rate.

The earlier heart failure is treated with digitalis the better the response. The prophylactic use of digitalis in patients with heart disease but without failure even has been advocated, when decompensation may be expected to occur.[27, 35] Most authors[3, 4, 28] do not agree with this concept.

Auricular Fibrillation.—Digitalis has two effects on hearts with auricular fibrillation:[4] (1) Through the vagus it tends to perpetuate the circus movement and foster auricular fibrillation by shortening the refractory period of the muscle; (2) by direct myocardial effect it impairs auriculo-ventricular conduction, thus preventing most of the auricular impulses from reaching the ventricle.

The treatment of auricular fibrillation depends somewhat on the duration of the arrhythmia. In general, digitalis is indicated if there is evidence of circulatory insufficiency and preferred if there is significant underlying heart disease, even without failure.[4, 28] If fibrillation is paroxysmal, occurs infrequently and tends to subside spontaneously, probably no treatment is necessary.[4, 27] Quinidine is recommended as the drug of choice if there is no apparent heart disease, no significant cardiac enlargement nor signs of cardiac failure.[29]

Though it has been generally held that digitalis does not convert auricular fibrillation to sinus rhythm and that its use in paroxysmal auricular fibrillation may tend to perpetuate the arrhythmia,[2, 4] there are reports in the literature that this is not necessarily so. Feibush[30] reports the case of a man with auricular fibrillation in whom regular sinus rhythm was restored repeatedly after the administration of digitoxin. Fahr and LaDue[31] reported the establishment of regular sinus rhythm in eight of 102 cases of chronic auricular fibrillation who received lanatoside C, and in all of seven patients with paroxysmal auricular fibrillation. They were unable to explain this quinidine-like action, but suggested the large doses employed or the purity of the glycoside used as possible important factors.

Auricular Flutter.—Digitalis should be used in cases of auricular flutter when heart failure is present, in the presence of organic heart disease and enlargement of the heart and when the patient has failed to respond to quinidine.[4, 27, 28] Digitalis does not abolish the flutter but tends to convert it to auricular fibrillation by shortening the refractory period of the auricular musculature; however, the ventricular rate is slowed. In these patients auricular fibrillation may be followed by sinus rhythm when digitalis is discontinued. However, this is not the rule. Movitt[3] recommends that digitalis be continued after auricular fibrillation develops in dosage sufficient to keep the ventricular rate between 70 and 80. Bloomfield[32] suggests that digitalis be used in flutter in the same manner as in fibrillation. In obstinate cases, in which quinidine must be employed, it is advisable to administer digitalis prior to giving quinidine in order to increase the A:V block and prevent inordinate increases in ventricular rate during conversion which might throw undue strain on the heart.[4]

Paroxysmal Supraventricular Tachycardia.—If vagal stimulation fails to stop a paroxysm of auricular tachycardia, digitalis or one of its derivatives may be used, and lanatoside C has recently been recommended as the drug of choice by Barrow.[34] Digitalis is certainly to be preferred in patients with severe underlying heart disease, those in whom the attack has caused heart failure or in whom quinidine has been used without success.[4]

FACTORS MODIFYING THE INDICATIONS FOR DIGITALIS

Digitalis has been found to be more effective in some cases of cardiac failure or auricular fibrillation than others. Such apparent discrepancies become clear if the action of digitalis be kept in mind for the drug can be beneficial only if the symptoms are due either to impaired myocardial function which can be helped, or to ventricular tachycardia secondary to auricular fibrillation, which can be slowed by impairing A:V conduction.[4] Digitalis is ineffective in heart failure due to mechanical impediments such as constrictive pericarditis, extreme mitral stenosis or auricular thrombi occluding the mitral orifice. Obviously, it will be ineffective when myocardial damage is too severe to permit the heart muscle to respond.

CONTRAINDICATIONS

Digitalis is not indicated in tachycardia due to infections, fevers, hyperthyroidism, drugs or neurocirculatory asthenia. Nor is digitalis indicated in sinus arrhythmia, sino-auricular block, nodal rhythm or ventricular escape, except when it is given for associated heart failure.[4, 27, 28] Ventricular extrasystoles, or partial or complete heart block, do not contraindicate the use of digitalis if heart failure is present.

Coronary Artery Disease.—Most authors[4, 27, 28] now agree that coronary artery disease, as manifested by myocardial infarction, is in itself neither an indication nor a contraindication to the use of digitalis. Gold's[25] study of 120 anginal patients, as mentioned before, definitely shows that digitalis will not aggravate cardiac pain.

There has been some difference of opinion on the use of digitalis in patients with acute myocardial infarction. The controversy has been well summarized by Friedberg.[4] It is feared that by strengthening the force of cardiac contractions digitalis might cause rupture where the heart muscle was weakened by infarction, or might dislodge a mural thrombus. This concept would imply increase of intraventricular pressure from digitalis.

However, digitalis decreases the high diastolic pressure in the ventricle which is associated with heart failure.

It is also feared that digitalis would increase the tendency to arrhythmias. On the other hand, by improving the nutritional state of the myocardium, digitalis may well counteract such tendencies to ectopic activity.

Another objection is that digitalis reduces the clotting time and increases the tendency to embolization. The evidence for this objection is not conclusive and, besides, the use of heparin and dicumarol may neutralize the thrombotic effect of digitalis.

Unless failure is controlled easily by the more immediate measures of bed rest, oxygen, opiates and mercurials, most authorities now use digitalis in the treatment of heart failure and myocardial infarction.[4, 27, 28] Eggleston and Gold[36] proceed cautiously, and even suggest using less than digitalizing doses in such cases.

Shock and Infection.—Digitalis is contraindicated in cases of peripheral circulatory failure associated with shock, from any cause, including acute infections such as pneumonia[37] or diphtheria.[4] It only diminishes further the insufficient cardiac output. In rheumatic fever the drug is generally given though it is usually ineffective.[4, 28]

Digitalis and Calcium.—It has been thought that digitalis and calcium acted synergistically and might be dangerous when given together. Two deaths have been reported following the intravenous injection of calcium gluconate in digitalized patients.[38] Friedman and Bine,[39] however, in perfusion experiments on embryonic duck hearts, found no evidence of synergism whatever.

DIGITALIS INTOXICATION

Digitalis will cause toxic symptoms if given in excessive doses, and claims to the contrary indicate either an inert product or are untrue.[2] It is important to keep in mind that human beings differ in their tolerance to digitalis. Also, in some patients, especially those with advanced congestive heart failure, the toxic and therapeutic doses may be almost identical and, in these, it is difficult to obtain satisfactory clinical improvement without producing some toxic symptoms.

The most common results of overdosage with digitalis are gastrointestinal disturbances and disturbances in cardiac rhythm. However, there is some evidence that neurologic disturbances may be more frequent than heretofore believed.[40]

Gastrointestinal Disturbances.—Probably the most common early symptom of excess digitalis is anorexia, and this is frequently accompanied by an ill defined feeling of malaise. Nausea and vomiting follow if the drug is continued, or may occur without the prodromata. The vomiting is believed to be of central origin for it also occurs after the parenteral administration of digitalis.[41] Large oral doses of the drug, given at one time, can cause local gastric irritation with resultant emesis.[4] Diarrhea also may occur, but this is an uncommon symptom of digitalis overdosage and rarely appears without other evidence of intoxication.

Toxic Effects on the Heart.—The cardiac manifestations of digitalis intoxication may be profound. Clinically they are seen as arrhythmias and disturbances in conduction. Pathologic myocardial lesions can be produced in experimental animals by giving large doses of digitalis, much larger than those used therapeutically in man.[42] These lesions consist of focal necrosis, cellular infiltration, interstitial edema, hemorrhages, fibrosis and hyaline degeneration. There is experimental evidence also that in the presence of hyperthyroidism smaller doses of digitalis will produce the same lesions.[43] It has been suggested that repeated toxic doses of the drug seem to sensitize the heart to subsequent action of digitalis so that smaller amounts may produce toxicity.[49]

Premature beats are the commonest cardiac manifestations of digitalis overdosage.[2] They may become so frequent as to cause bigeminus. Despite its clinical importance and the frequency with which it is encountered, digitalis bigeminus has attracted little attention in the American literature. Sagall and Wolff[44] recently analyzed fifty cases of bigeminus. Bigeminus is found not uncommonly in patients who have never received digitalis. It may be produced by varying amounts of digitalis and may appear following a small increase in the maintenance dose. The extrasystoles are almost always ventricular in origin when due to digitalis. Bigeminal beats bear no relation to other manifestations of digitalis intoxication, and may be the only one. The appearance of digitalis bigeminus is probably a serious prognostic sign. Of Sagall and Wolff's fifty cases, fourteen or 28 per cent died, and they believe that some or all of these deaths may have been due to digitalis. However, this conclusion cannot be accepted completely without serious consideration of the condition for which the drug was given.

Digitalis causes disturbances in cardiac conduction and excessive slowing of the pulse has long been recognized as evidence of digitalis overdosage. Usually the drug should be stopped if the heart rate falls below 60 per minute,[4] and certainly if it drops below 50.[28] Digitalis frequently causes partial heart block as evidenced by prolongation of the PR interval on the electrocardiogram; greater degrees of partial heart block up to complete auriculo-ventricular dissociation may occur with excessive doses.[4]

As a result of a direct effect on the S-A node, toxic doses of digitalis may produce conspicuous bradycardia, sinus arrhythmia, sinus arrest or auricular standstill. Sino-auricular conduction may be so depressed as to result in sino-auricular block, A:V nodal rhythm, nodal rhythm with A:V dissociation, and reciprocal and interference beats.[3, 26]

Auricular fibrillation may be a manifestation of digitalis intoxication in hearts with a previously normal rhythm.[3] Rarely, sinus tachycardia is

caused by digitalis and may precede paroxysmal auricular tachycardia.[4, 45] Overdosage with digitalis may lead to ventricular tachycardia or ventricular fibrillation, the latter resulting in sudden death.[3] Friedman and Bine's[46] experimental work suggests that premature ventricular contractions and ventricular tachycardia produced by digitalis may be associated with a deficiency of potassium in heart muscle, and a recent report by Enselberg and his associates[50] indicates that the clinical administration of potassium is of value in cases of digitalis intoxication.

Toxic Effects on the Nervous System.—Cerebral symptoms are common in cases of digitalis intoxication. Weakness, lethargy and mental confusion have been noted frequently in the elderly patients on the wards at St. Louis City Hospital and have come to be valuable warning signals against serious overdosage. Headache, visual blurring, scotomata and colored vision (yellow, green) all occur. Batterman and Gutner[40] have described unusual manifestations of digitalis toxicity characterized by neuralgia of the lower third of the face, and by pain in the upper extremities and lower lumbar and calf muscles. They assert that the neurologic manifestations of digitalis intoxication are more common than is usually appreciated, being only slightly less frequent than gastrointestinal symptoms.

Digitoxin Toxicity.—The prevailing use of digitoxin has created some special problems. It has been reported to produce serious arrhythmias in therapeutic doses,[47, 48] and there has been a tendency for severe toxic symptoms to develop suddenly without the usual warning of preceding milder symptoms. This has been experienced at St. Louis City Hospital also. Digitoxin, therefore, must be used more cautiously than the whole leaf.

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ACTH, CORTISONE REDUCE CANCER PAIN BUT DO NOT STOP DISEASE

Evidence gained in a study of far advanced cancer patients by three Chicago doctors indicates that treatment with ACTH and cortisone is helpful in reducing the pain and other complications of the disease but does not materially alter the natural course of the disease.

Drs. Samuel G. Taylor III, John P. Ayer and Roger S. Morris, Jr., reported on their study of 26 advanced cancer patients in the November 25 *Journal of the American Medical Association.* All three doctors are associated with the Presbyterian Hospital, Chicago.

The report says in part: "The clinical response of most patients was reduction in fever, if present, increased appetite and improved strength and well-being. At times the effects were dramatic and appeared usually within 48 hours after ACTH therapy and within four to six days after starting treatment with cortisone.

"Patients hitherto bedridden, vomiting and requiring heavy doses of narcotics were able to become ambulatory, reduce or stop their reliance on narcotics, and eat astonishing meals."

According to the report, however, the "improved" condition of the patients was only temporary. The natural course of the disease continued—12 of the patients already have died. In addition, the hormone treatment produced disturbing side effects.

Some of the side effects produced by ACTH and cortisone which, according to the doctors, may make "repeated or prolonged therapy ill advised" were chemical changes in the body, excess sugar in the blood, mental and personality changes, sexual and skin disturbances, development of moon-shaped faces and unnatural fat deposits in different parts of the body.



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Halpin, L. J.: An Appraisal of Therapeutic Procedures in Bronchial Asthma, J. Iowa M. Soc. 39:468 (Oct.) 1949.

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ON THE CHEMICAL RELATIONSHIP OF CERTAIN STEROIDS AND THEIR IMPORTANCE IN THE HUMAN ECONOMY

WITH SPECIAL REFERENCE TO CARDIOLOGY

JULIUS JENSEN, M.D.
ST. LOUIS

PROGRESS OF RESEARCH in physiologic chemistry continues to demonstrate the great importance of derivatives of cyclo-pentano-perhydrophenanthrene in the human economy. Cyclo-pentano-perhydrophenanthrene itself probably does not occur in free form in the body but a large number of substances exist of which cyclo-pentano-perhydrophenanthrene is the basic formula and which are of vital importance to life and vital functions in both animals and plants.

In the human body, the basic cyclo-pentano-perhydrophenanthrene derivative is cholesterol. It is, therefore, necessary to understand the metabolism and functions of cholesterol and of compounds closely related to it. Evidence is growing that cholesterol has an important function in the nervous system and in arteriosclerosis and that it may be a precursor of the sex hormones and of the corticosterones.

The corticosterones are assuming a steadily increasing importance. They certainly are concerned with electrolyte balance, especially of sodium, and also with water balance. It is entirely possible that

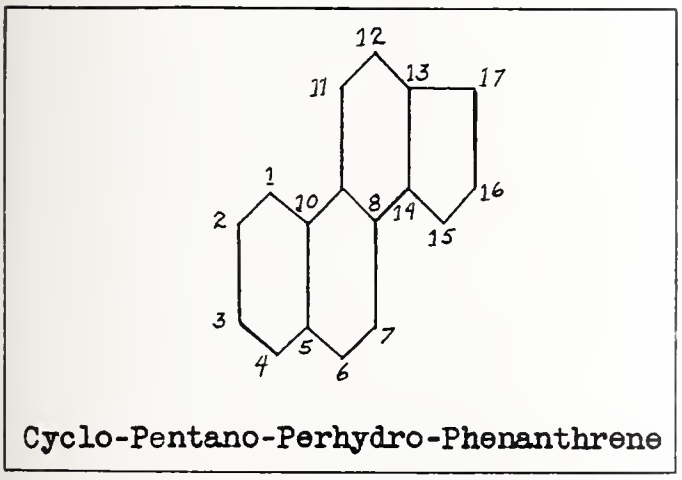


Fig. 1.

they are involved in the lower nephron nephrosis syndrome; there is also some evidence that they exert an important control on the blood pressure, both normally and in hypertension; they are involved in carbohydrate metabolism; they are genetically, as well as chemically, related to cholesterol. Recent evidence shows that they also play a part in collagen diseases and in immunologic processes. The classification of all of these relationships awaits additional evidence but, in the meantime, it is important to keep clearly in mind such evidence as is now available.

The basic structure of cyclo-pentano-perhydrophenanthrene is found elsewhere in nature. It is the foundation of the vitamin D group. Its derivatives are found in toad poison and extensively in plants. It is substances of this kind which are being studied in an effort to find a short cut in the production of cortisone which is one of the

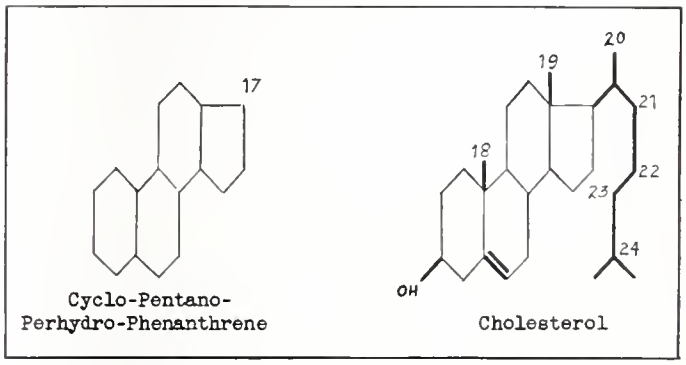


Fig. 2.

corticosterones. Cyclo-pentano-perhydrophenanthrene is also the basic structure of the digitalis glycosides.

From this brief introduction, it is obvious that derivatives of cyclo-pentano-perhydrophenanthrene form a most important group of substances which may in the future be shown to be an essential part of life. It is further becoming apparent that errors of metabolism of these substances are an important part of many pathologic conditions which are now poorly understood.

CHOLESTEROL

Of the compounds of the cyclo-pentano-phenanthrene group, cholesterol probably has been subjected to the longest and most thorough study. It is found in various animal foods especially fatty foods including butter and yolk of eggs.

Cholesterol is found in the human body in the intestine, in the liver and in the plasma. It also passes from the plasma into other organs.

In the intestine, cholesterol is obtained partly from the food and partly from the bile. In a fat poor diet, the body takes in from 39 to 109 mg. cholesterol, in an average diet from 200 to 360 mg. and in a fat rich diet 1,400 mg. of cholesterol. Through the bile, the body excretes at least 500 mg. of cholesterol and 2,000 mg. cholic acid.[11]

When cholesterol arrives in the intestine, it either remains free or is esterized to long chained fatty acids.[13, 14, 15, 16] In order to be absorbed through the intestinal wall, it must be esterized.[13, 14] The amount of cholesterol which is absorbed depends upon the amount of fatty acid which is available.[16] In a fat poor diet, this can be much reduced and this is the rationale of the "fat free diet."

The cholesterol which remains free remains unabsorbed. Much passes through the stages of cholestenone and coprostanone to coprosterol which is found in the colon.[1] Some is reduced to dehydrocholesterol.[1]

Cholesterol esters, then, pass through the intestinal wall into the plasma by which they are conveyed to the liver. The liver both synthetizes and

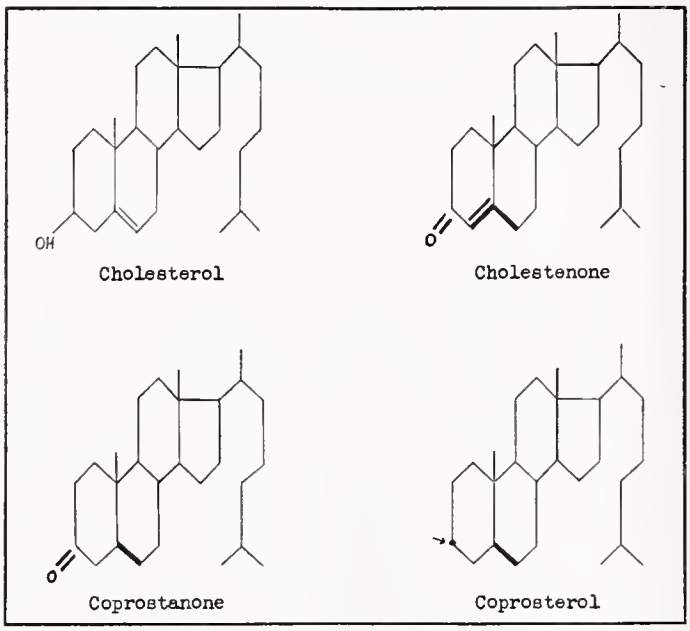


Fig. 3.

breaks down cholesterol. Cholesterol in the liver is obtained from three sources. As just mentioned, cholesterol esters are brought to the liver in the plasma. The liver then transfers the fatty acids from cholesterol to phosphatides, thus liberating cholesterol.[11]

Cholesterol may be synthetized from acetate, acetone and water. Water furnishes about 50 per cent of the hydrogen atoms in cholesterol.[1] The acetate is formed from fatty acids and ketogenic amino acids.[1] These again may be formed from carbohydrates. Thus, both fats and carbohydrates contribute to the formation of cholesterol.

Table 1. *Action of Corticosterones*

Carbohydrate Metabolism
1. Balances Insulin Effect
2. Favors COH Storage in Liver
3. Favors Glyconeognesis from Proteins
Nitrogen Metabolism
1. Favors Excretion of Nitrogen
2. Favors Excretion of Uric Acid

The third source of cholesterol is the steroid hormones which in the liver are transformed to cholesterol. (It has been thought that failure of this function in liver disease (jaundice) may be responsible for increase of the hormones in the body and that this may be the explanation of the improvement seen in rheumatoid arthritis when jaundice develops.)[10]

The liver disposes of cholesterol thus obtained in at least three different ways. It may be excreted in the bile as free cholesterol and arrive as such in the intestine or it may first be reduced to cholic acid and then be excreted in the bile. Finally, it may once more be given off to circulate in the plasma.

In health, the concentration of cholesterol in the plasma depends largely upon the amount which has been absorbed from the intestine. The amount absorbed depends, as mentioned, upon the amount of long chained fatty acids available for esterization. The physiologic cholesterol level of the plasma is, therefore, influenced more by the amount of fat in the food than by the amount of cholesterol. Hypercholesteremia may occur in a number of conditions, for instance, pregnancy, lipoid nephrosis, hypothyroidism, diabetes. Cholesterol circulates in the plasma in colloidal dispersion.[3] It is tied with a weak bond to proteins, especially alpha$_2$ and beta globulin,[4] but also to albumin and gamma globulin.[3] It is contained in molecules which may vary greatly in size.[5] These molecules may become large and of low density when measured by the "preparative and analytic centrifuge" and when compared with the conditions under which cholesterol is normally found in rabbits or in young men and women in whom there is no evidence of arteriosclerosis or other conditions which may affect lipoid metabolism. It appears as if the lower density of these molecules is at least partly due to a lower content of protein in the molecule. The giant molecules have been demonstrated in rabbits after pro-

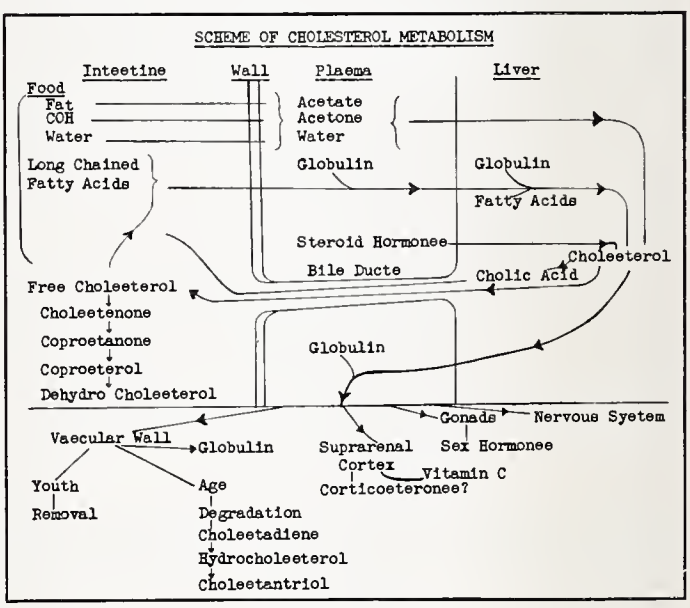


Fig. 4.

longed feeding with cholesterol and in patients who had shown definite evidence of atherosclerosis (coronary thrombosis). It has been suggested[5] that atherosclerosis is in some way associated with the appearance of cholesterol in these large molecules rather than with hypercholesteremia as such. This finding would explain the previous failure to demonstrate a relation between the cholesterol level of the blood and the degree of atherosclerosis.

The intravascular pressure may force cholesterol thus suspended to penetrate the intima of the blood vessels.[6] When it arrives in the subendothelial spaces, it apparently is separated from the protein to which it is conjugated, and precipitated.[7] In youth, cholesterol is then removed by cells which have the character of fibroblasts and no harm is done.[7] In older persons, cholesterol is at first taken up in "foam cells," but eventually these disintegrate and the cholesterol is liberated.[7] It crystallizes and fuses into masses which act as irritants and provoke the growth of fibrous tissues.[7] The lesions increase in size and suffer in nutrition because the diffusion of plasma becomes inadequate. Further development is general arteriosclerosis. Not all of the cholesterol remains as such in the arterial deposits. At least four of its oxydation products have been obtained from arteriosclerotic human aortas, namely 3, 5 cholestadiene 7 one, 4, 6 cholestadiene 3 one, 7 beta hydrocholesterol and 3, 5, 6 cholestrantriol.[8]

This process is favored by metabolic conditions which include high cholesterol contents of the plasma.[9]

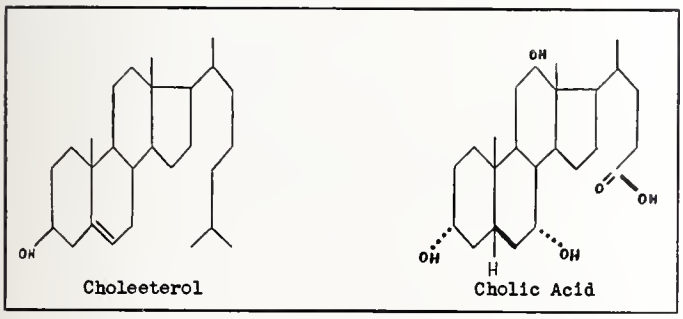


Fig. 5.

Some of the circulating cholesterol is deposited in the suprarenal cortex, where there is also normally stored an abundant amount of vitamin C.[17] A combination of the two has been obtained from the adrenal glands of cattle.[18] The concentration of these two substances depends upon a hormone from the anterior pituitary lobe.[17] In the presence of this hormone, the cholesterol and vitamin C will decrease in the cortex if the animal suffers cold, burns, trauma, or hemorrhage.[17] This effect does not occur in hypophysectomized animals.[17] In this respect, the concentration of cholesterol parallels the formation and release of the corticosterones.[17] There is strong evidence that cholesterol is a parent substance of corticosterones.[17] There is also evidence that the cortex synthetizes cholesterol.[1] There is a correlation between the decrease of adrenal cholesterol and ascorbic acid and increase in liver glycogen and decrease in circulating lymphocytes in fasting animals.[17] There is also a decrease of cholesterol esters in the plasma following the injection of ACTH.[41]

Cholesterol is present in high concentration also in the interstitial cells of the testicles and sometimes in the corpora lutea.[19] Cholesterol tagged with deuterium has been transformed into progesterone.[17] A close relationship thus is established between cholesterol and the sex hormones. The hypercholesteremia observed during pregnancy may, in some unexplained manner, be a manifestation of this relationship.

Finally, cholesterol is an important constituent of the nervous system. Here it differs from cholesterol in most other parts of the body in that it is permanently fixed to the myelin sheaths.[1]

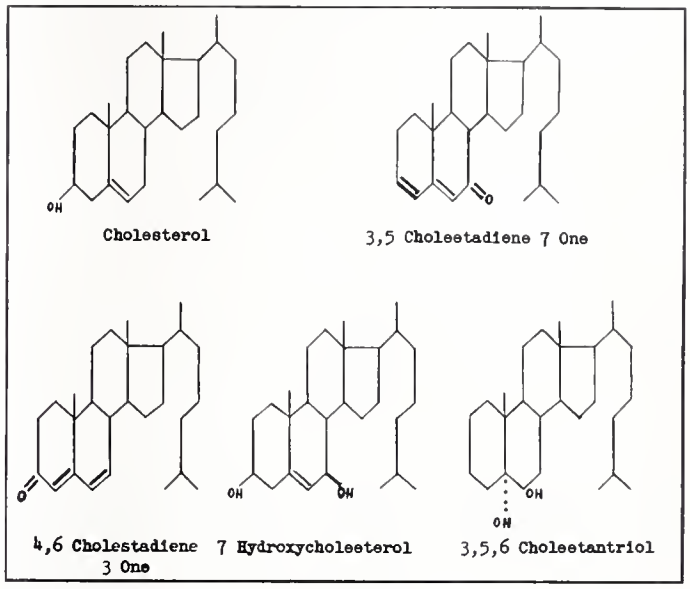


Fig. 6.

THE CORTICOSTERONES

The suprarenal cortex contains at least twenty-eight different steroid compounds.[20, 21] Much still remains to be learned about them. The basic formula for the corticosterones is that of 11 desoxycorticosterone. It differs from cholesterol in three respects: (1) in position 3 there is an O atom instead of an OH group, (2) the double bond is from 5 to 4 instead of from 5 to 6, and (3) the side chain is different.

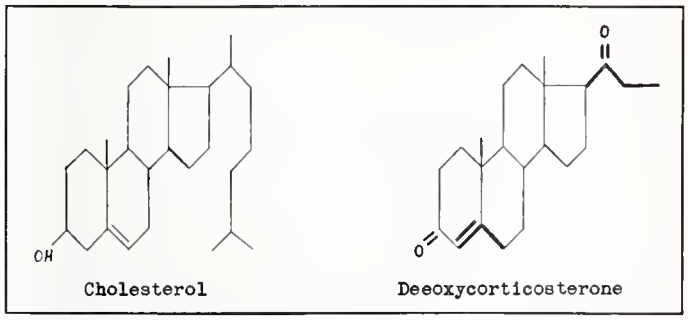


Fig. 7.

It was noted that the cortex is rich in cholesterol and in vitamin C. There is now considerable evidence that cholesterol is the parent substance of the corticosterones and that this relationship is of fundamental importance in the body economy,[17] especially in maintaining the defenses of the body and in its reactions to strain and stress.

The body responds in a similar manner to many forms of strain, be it exposure to cold, hemorrhage,

trauma to muscles and long bones, painful stimuli, cutting or burning of the skin, burns, intraperitoneal injection of cold isotonic saline, the inhalation of volatile anesthetics[17] or mental stress. All these stimulate the sympathetic system and the secretion of adrenalin. Adrenalin stimulates the eosinophil, glandular elements of the hypophysis to secrete the adrenocorticotropic hormone (ACTH).

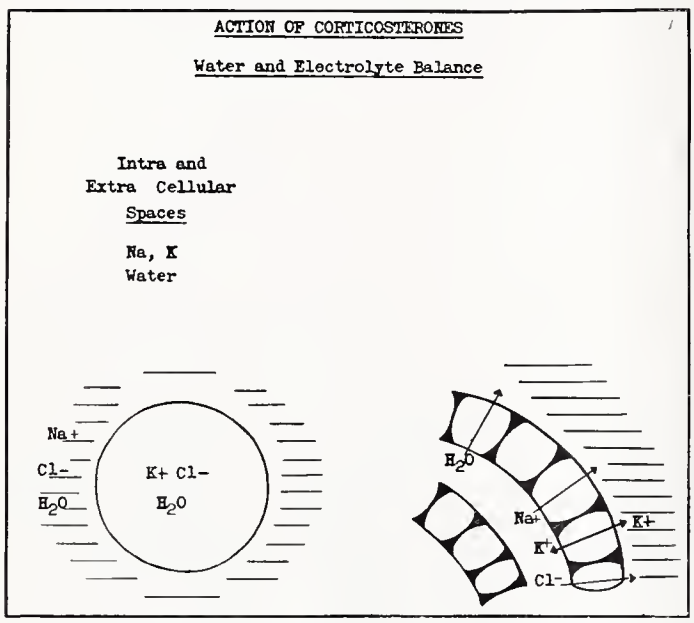


Fig. 8.

This stimulation is apparently both direct and indirect.[38] It can even be obtained by the injection of insulin which then initiates a chain of events resulting in the reduction in the eosinophil count, suggesting increased excretion of cortisone[40] ACTH has a profound effect upon the cortex. It causes prompt depletion of cholesterol and vitamin C and excretion of corticosterones and, also, as mentioned, decrease of cholesterol esters in plasma.[41] This reaction is of tremendous velocity for in a short time twenty times as much corticosterone may be excreted or can be extracted from the cortex.[38] This reaction always occurs with these intermediary stages, for strain does not cause these cortical changes in hypophysectomized animals. These are the physiologic changes of the alarm reaction of Selye.[40] In the early stages this leads to overaction of the cortex but, if long continued, the cortex may become exhausted and it is Selye's belief that this may lead clinically to various syndromes which are characterized by cortical dysfunction and which are now alleviated by the administration of these hormones.

It is possible that these hormones may regulate the renal circulation because the same factors of strain which were mentioned underlie the phenomena examined by Trueta.[26] Trueta refers repeatedly to the hormonal factors which determine the shunts between the glomerular, and the collateral, medullary circulation. It is easier to accept the view that electrolytes and other substances are retained in the blood because they are never filtered through the glomerular epithelium than that they are reabsorbed in excessive quantities through diseased tubular cells. Thus, it is entirely probable that the corticosterones are involved in the syndrone of lower nephron nephrosis.

The cortical steroids fall into three groups: 11-desoxycorticosterones, corticosterones and sex hormones.

Desoxycorticosterones, especially 11-desoxycorticosterone, are concerned with the regulation of the inorganic substances, electrolytes and water.[22] Sodium and chlorides are retained by it from both sweat and urine and it encourages excretion of potassium.[22] Desoxycorticosterone affects exchange of electrolytes and fluid on two levels. It maintains the proper distribution of electrolytes between intracellular and extracellular fluids[23]and it also regulates the reabsorption of sodium and water through the cells of the convoluted tubules.[23] The renal regulation and the regulation between the intracellular states may vary independently of each other.[23]

Desoxycorticosterone also has a vasoconstrictor effect upon the efferent arterioles from the glomeruli.[24] If this effect is excessive, it may disturb renal circulation resulting in the release of renin, which is a factor in the pathogenesis of renal hypertension.[24] If the blood vessels are sensitized by diminution of secretion of the neural hypophysis, the combined action of epinephrine, desoxycorticosterone and of renin may result in generalized arteriolar narrowing and consequent diastolic hypertension.[24]

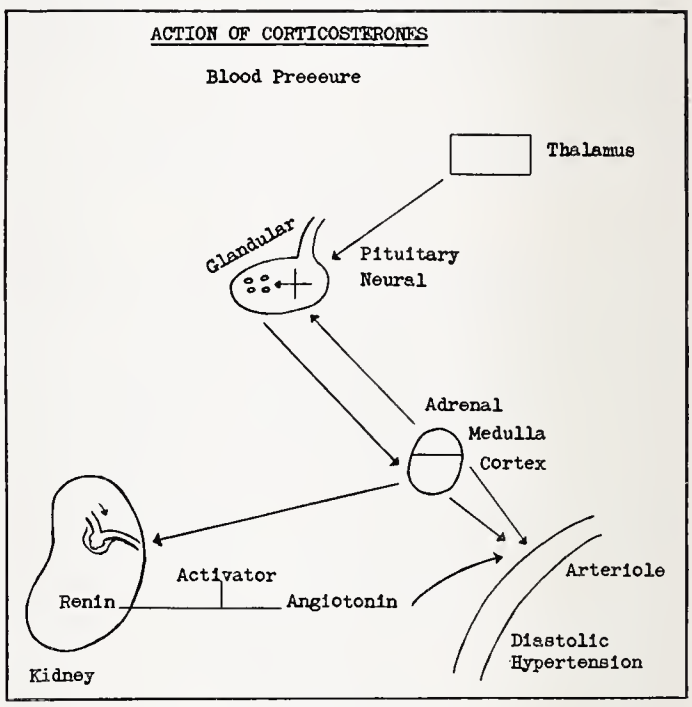


Fig. 9.

The corticosterones derived from desoxycorticosterone show changes in two atoms: in position 11, two hydrogen atoms may be replaced by one oxygen atom or one hydrogen atom may be replaced by a hydroxol group, and, in position 17, one hydrogen atom may be replaced by one hy-

droxyl group. The names of these substances are: corticosterone, or compound B (11-hydroxyl group), 11-dehydrocorticosterone, or compound A (11-oxygen replacing two hydrogen atoms), 17-hydroxycorticosterone, or compound F (hydroxyl groups in positions 11 and 17), and 11-dehydro, 17-hydroxycorticosterone, or compound E (oxygen in position 11 and hydroxyl in position 17).[22]

These compounds are powerful hormones which regulate the metabolism of carbohydrate, protein and fat. The 17-hydroxycorticosterones also affect the lymphoid tissues, eosinophils and monocytes but not the polymorphonuclear leukocytic system, as well as the condition of the connective tissues in the body. Of the metabolic effects, the diabetogenic is most impressive.[22] They exert this effect through several mechanisms: they may depress the function of the beta cells of the pancreas and thus suppress the formation of insulin; they also may inhibit the utilization of glucose in the peripheral tissues;[22] they accelerate gluconeogenesis from proteins and storage of the newly formed glucose in the liver. Muscular endurance is also greatly increased.[38] Glycosuria also may result from lowering of the renal threhold.

They accelerate the breakdown of proteins and increase the excretion of both nitrogen and uric acid.[22] In this connection, it is noted that they interrupt the symptoms of gout and render it more susceptible to subsequent treatment with colchicum.

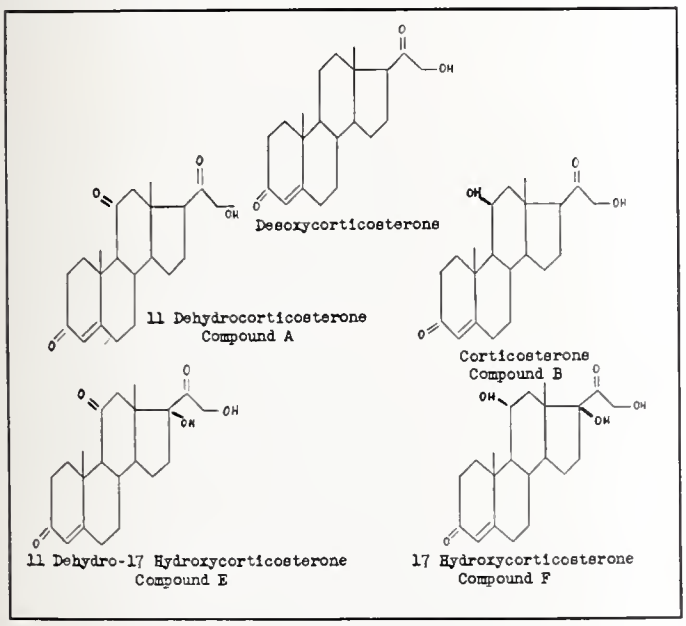


Fig. 10.

The two 17-hydroxycorticosterones (the cortex contains predominantly compound F[22]) affect various elements of the hematopoietic system. They cause lysis of fixed lymphoid tissue[22] and a transitory decrease of the circulating lymphocytes.[22] This effect becomes greatly accentuated in lymphatic leukemia and in lymphosarcoma, in which large tumor masses may melt away in a few days. However, for reasons not understood, the effect is temporary. The effect probably is related to the remarkable synergistic effect between the sex hormones and folic acid antigonists which also have an effect, albeit more sustained, upon leukemia. When given together in doses which are individually safe, their combined effect is greatly accentuated.[37]

17-hydroxycorticosterones also cause a decrease, almost to the point of disappearance, of the circulating eosinophils.[28] This last effect is so specific

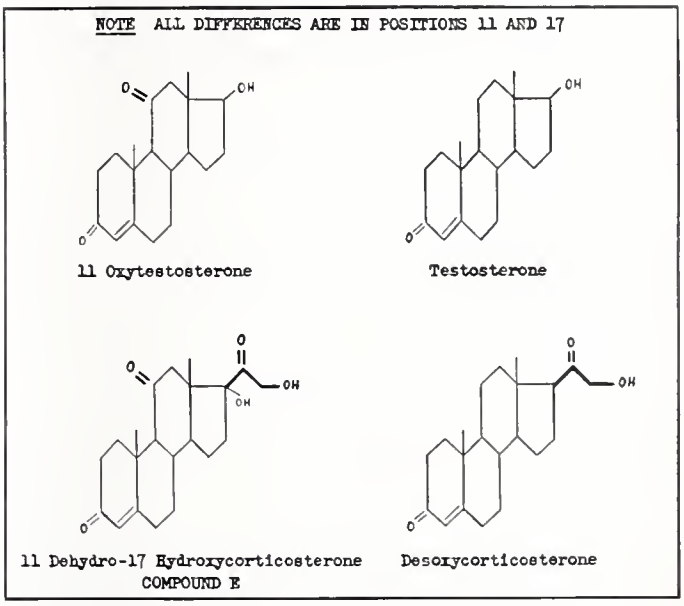


Fig. 11.

that it has been used to assay preparations containing these corticosterones.[22] 17-hydroxycorticosterones control clinical allergy such as asthma and hay fever,[38] of which eosinophilia is an important feature.

Almost sensational has been the effect of 11-dehydro-17-hydroxycorticosterones on the group of diseases which have been called collagen diseases. In this group belong rheumatoid arthritis, rheumatic fever, disseminated lupus erythematosus and periarteritis nodosa. These diseases affect fundamentally the basic amorphous substance of connective tissue. The essential nature is not understood; is is not known whether the changes are a common tissue reaction to various causes or whether they are different aspects of one fundamental etiologic factor. They have in common fibroid degeneration which is an alteration of the connective tissues evidenced by swelling and eosinophilia and refractity of its fibers, sometimes accompanied by similar changes in the ground substance.The lesions bear some resemblance to those seen in allergic states but also to others which are not allergic. It is not yet even suggested whether the effect of corticosterones is similar in allergic states and in collagen diseases.[39] At least in the rheumatic diseases there is in the interfibrillar material or ground substance of the connective tissues of the joints an exudative disturbance. Apparantly hyaluronidase renders these tissues more permeable and this is an important factor in the swelling and deformity of the

joints.[38] The effect of cortisone seems to be directed against this change with consequent lessening of pain, swelling and deformity.

It generally is stated that this "antirheumatic" effect is particularly associated with oxygen in posi-

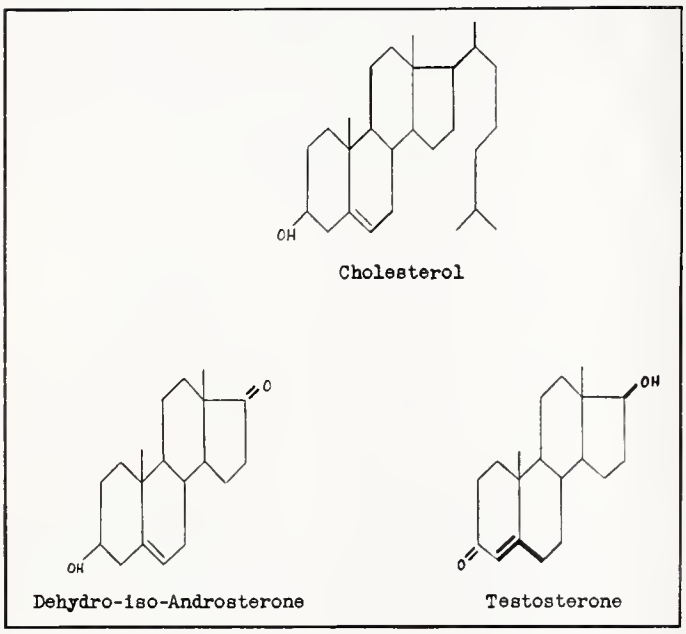


Fig. 12.

tion 11, but a similar, though less striking, effect in arthritis has been obtained with other phenanthrene derivatives which do not possess O in position 11 (estrone, vitamin D_2, pregnenolone).

The third kind of hormone produced by the supraneal cortex is an androgen.[22] It is 11-oxytestosterone; it is also compound E without the side chain. Thus, the close relationship between compound E and testosterone is shown, for the latter is compound E without the side chain and without oxygen in position 11. Also, testosterone is desoxycorticosterone (the basic corticosterone) with an OH replacing the side chain in position 17.

This cortical androgen supplies all the androgenic activity in women and two thirds of that of the

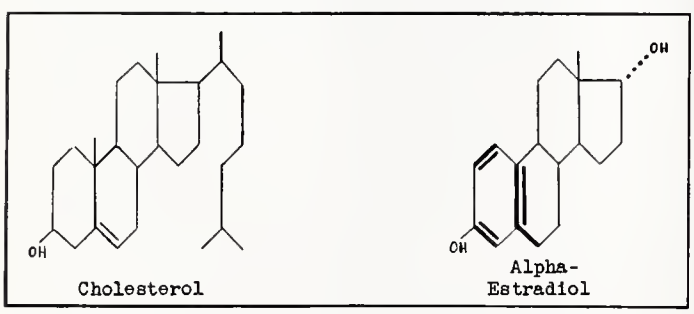


Fig. 13.

male.[22] It is also instrumental in the retention of nitrogen, phosphorus, potassium, sodium and chloride.[22] Thus, in some respects it balances the function of some of the other corticosterones.

An estrogen, estrone, also has been obtained from the cortex.[27] It will be discussed presently.

THE ANDROGENS[28]

A number of substances have androgenic effect; but there is substantial evidence for only one potent testicular androgen, testosterone. Its relation to cortical androgen has been discussed. It is related to, and may well be derived from, cholesterol through the following stages: If the side chain and one hydrogen atom in position 17 are replaced by an oxygen atom, dehydro-iso-androsterone is obtained. This has a relatively weak androgenic effect. Dehydroandrosterone, its isomer, has been isolated from urinary concentrates. Removal of the double bond between position 5 and 6 results in androsterone. This is about three times more potent than dehydro-iso-androsterone. It has been isolated from urinary concentrates. If a new double bond is established between positions 5 and 4, oxygen replaces the hydroxyl group and a hydrogen atom in position 17, the result is testosterone, which is six times more potent than androsterone and the most potent androgen which has been obtained. It is almost certainly the testicular androgen. Its effects are known so generally that it is unnecessary to discuss them here.

THE ESTROGENS[28]

Of the estrogens, estradiol appears to be the principal hormone. It can be described as choles-

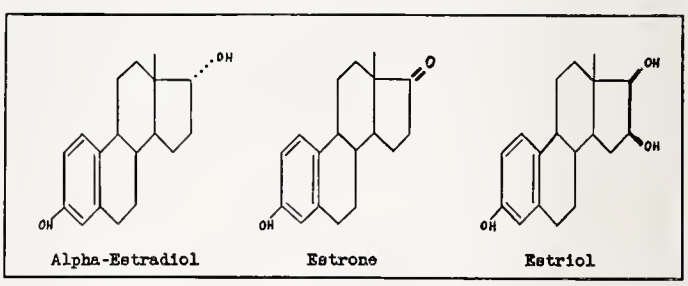


Fig. 14.

terol modified as follows: the double bond between positions 5 and 6 has been removed, but three new ones have been introduced, between 1 and 2, 3 and 4, and 5 and 10. Also, the methyl group has been removed from position 10 and a hydroxyl group has replaced the side chain in position 17. It is thus somewhat further removed from cholesterol and the corticosterones than are the androgens. Two isomers exist. Alpha-estradiol is about thirty times more potent than beta-estradiol. Estradiol is found with various, closely related, substances which probably are its immediate breakdown products: Estrone has an oxygen atom replacing one hydrogen and the hydroxyl groups in position 17; it is thus a reduction product of estradiol. In estridol, water has been added, resulting in hydroxyl groups in positions 16 and 17.[27]

These hormones are found especially in the urine during pregnancy. It is suggested that progesterone changes the stronger into weaker estrogens and thus prevents a hyperestrogenic state from developing during pregnancy.

Estradiol is obtained principally from the ovarian follicles and is the essential feminizing hormone. It also is produced in the suprarenal cortex, the

testes and the placenta. Estradiol is concerned with follicular growth, ovulation and estrus. It is produced increasingly during the postmenstrual phase of the menstrual cycle; following ovulation and through the menstrual period it is in abeyance.

Progesterone is the luteinizing hormone. Chemically, it is related more closely to the androgens than to the estrogens. Its structure is similar to that of testosterone except that an OH group in position 17 has been replaced by a short chain. It is still more closely related to desoxycorticosterone, for the only structural difference is that one "H" in the methyl group of the side chain has been replaced by a hydroxyl group. With such close chemical relationship, some resemblance in function may be expected.

Progesterone is produced by the corpus luteum and by the placenta. It is excreted through the kidneys as pregnandiol. In pregnandiol, hydrogen has been added in positions 3 (OH and H replacing O), 4 and 5 (displacing double bond), and in the first C of the side chain (OH and H replacing O). Pregnandiol is especially abundant in the urine of pregnant women. Its excretion is increased

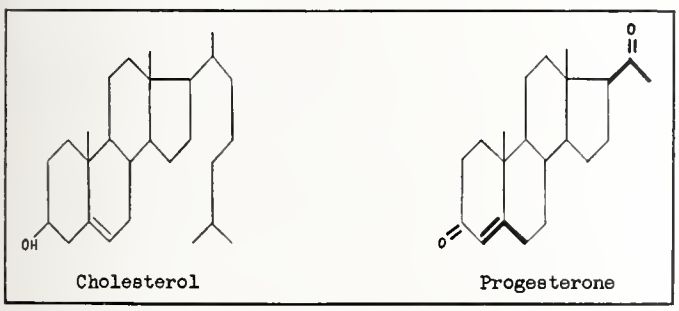


Fig. 15.

during the premenstrual or luteal phase and diminishes a few days before the onset of menstruation, paralleling the function of corpus luteum.

The principal effects of progesterone are associated with sexual function of the female: with estrogen it is effective in producing the mating reaction, it prepares the endometrium for implantation of the ovum and protects the uterus against oxytocic influences during pregnancy. It is also one of the factors in the preparation of the mammary gland for differentiation and secretion.

The function of progesterone is in several respects similar to desoxycorticosterone.[24] It acts to conserve water and electrolytes and it also sensitizes blood vessels to the action of angiotonin.[24] It has actually produced increase in blood pressure in persons with hypertension.[29] This activity of progesterone is related closely to the pituitary gland for it depresses the function of the neurohypophysis while it increases the eosinophils in the glandular hypophysis.[24] This is seen in pregnancy, in which there is also some tendency to retention of water and electrolytes and, in some patients, increase in blood pressure. These changes may occur separately or in combination. When any of them becomes sufficiently marked, toxemia is said to be present. Toxemia of pregnancy has the following elements: there is a vascular disturbance[30] which results in focal lesions chiefly seen in the liver and kidneys,[31] there is a tendency to increase in blood pressure due to a vasoconstrictor effect on the arterioles;[24] it is thought that such vasoconstriction may affect the efferent arterioles of the kidney, result in excessive secretion of renin and set in motion the

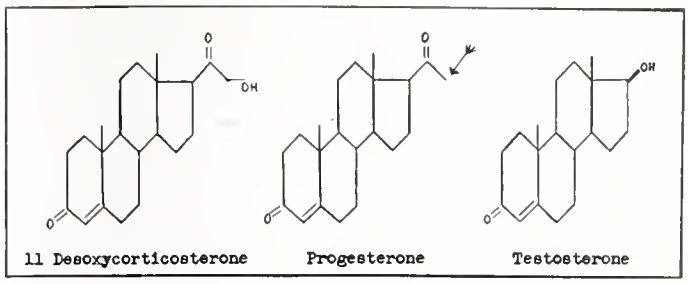


Fig. 16.

train of events which is now by some thought to be the pathogenesis of renal hypertension.[24] Independently of these effects, there is also a tendency to retention of salt and water.[32]

It has already been noted that desoxycorticosterone and progesterone are closely related chemically and functionally. Progesterone is produced in part by the placenta,[28] and the placenta is in some way involved in the pathogenesis of toxemia.[33] The physiologic effects of progesterone are closely related to the functional disturbances of toxemia. It has, however, not been proved that progesterone or a closely related substance produces toxemia. There are in toxemia of pregnancy certain elements of individual susceptibility and organ selectivity that are not explained merely by assuming excessive secretion of progesterone nor do excessive doses of progesterone produce toxemia. The pathogenesis of toxemia of pregnancy has not yet been explained, but the plot thickens.

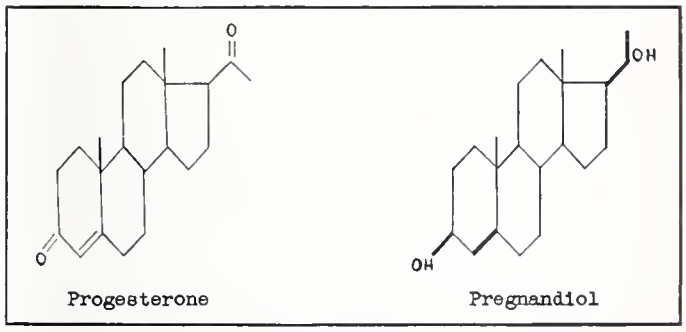


Fig. 17.

ANTIRACHITIC VITAMINS

A number of cyclo-pentano-perhydrophenanthrene derivatives have antirachitic qualities. They obtain this by radiation with ultraviolet rays with a wave length between 250 and 313 micromy. The radiation causes a rupture of the bond between positions 9 and 10. The exact nature of the antirachitic action is obscure but it is probably to encourage the deposition of calcium and phosphorus in bone. Failure of this function results in rickets.

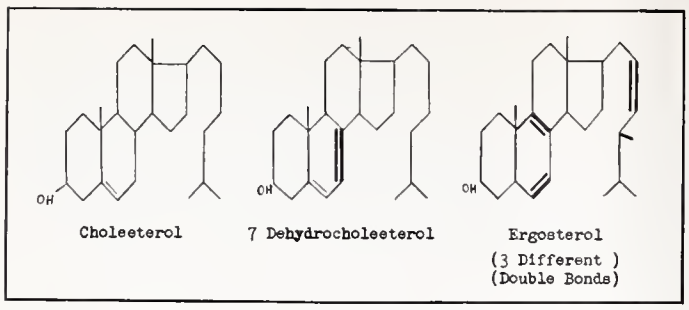


Fig. 18.

These compounds are called vitamin D. Two of them are of clinical importance.

7-dehydrocholesterol is of animal origin and is found in cod liver oil. It is similar to cholesterol except for a double bond between positions 7 and 8. Presumably, it has a similar origin and fate in the body. Activated 7-dehydrocholesterol has been designated vitamin D_3. In nature, activation occurs by exposure to sunshine or other ultraviolet rays.

Ergosterol is a similar compound. It differs from 7-dehydrocholesterol by having a double bond and an extra methyl group in the side chain. It is primarily produced by moulds and is found in yeast. Activated ergosterol is called vitamin D_2 or calciferol. It is not as effective against rickets as is vitamin D_3.

For a while, vitamin D_2 enjoyed a reputation in the treatment of rheumatoid arthritis and related

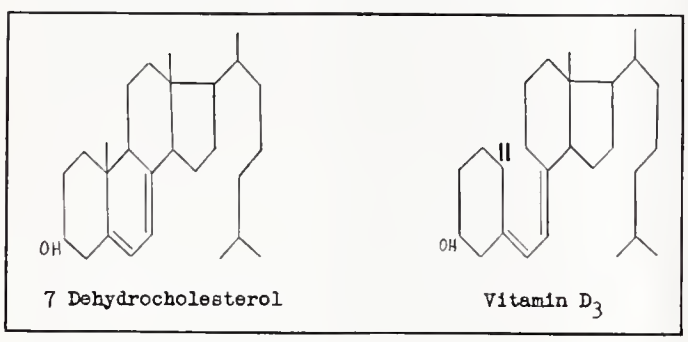


Fig. 19.

disorders. However, the dose required for therapeutic effect was so large as to be toxic and it is now abandoned. This observation is, however, of interest in view of the later experience with compound E.

THE CARDIAC GLYCOSIDES

Cyclo-pentano-perhydrophenanthrene derivatives are found extensively in plants. At present, the cardiac glycosides are of the greatest practical importance. Others are being considered as possible precursors for compound E. The cardiac glycosides are anhydrous compounds of an aglucone which contain the phenanthrene ring and digitoxose which is a 6 carbon open chain related to glucose. The aglucone is the effective portion of the molecule but its effectiveness is accentuated by the digitoxose. The different glycosides contain two or three molecules of digitoxose which are split off by the addition of as many molecules of water.

The aglucone differs from cholesterol in the following respects: there is no double bond in the 5-6 position, a hydroxyl group is attached to position 14, and the side chain is a lactone ring. Several of them have an additional hydroxyl group, the position varying with the compound.

As examples of potent aglucones may be mentioned digitoxigenin, (from digitoxin), gitoxigenin (hydroxyl in position 16, from gitoxin) and digoxigenin (hydroxyl group in position 11, from digoxin).

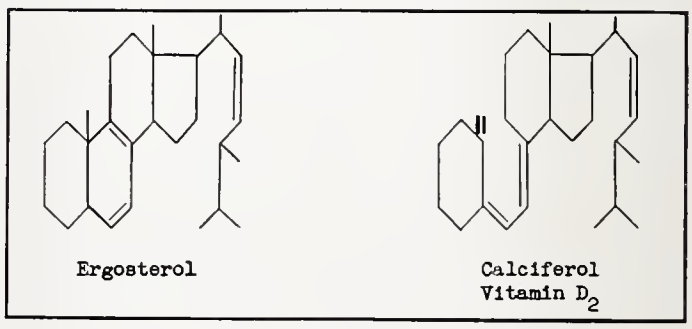


Fig. 20.

The parotid gland of the toad contains a toxin related to the cardiac glycosides. Before the introduction of digitalis, toad skins actually were used in the treatment of edema and it has long been known to the Chinese.[36] In the aglucone of this toxin, there is another link in the side chain and an additional short side chain has been added in position 5.

The cardiac glycosides are absorbed through the intestinal wall and in the blood stream they are bound to blood proteins. In this connection, it may be remembered that cholesterol is tied with a weak bond to alpha-2 and beta globulin. Some sterones are partly destroyed in the liver and it is possible that cardiac glycosides share their fate.

In the body, these glycosides have a special affinity for the heart. They also have effects on the other parts of the body, such as the nervous system, many of these effects being "toxic" in nature. It is generally assumed that digitalis is excreted through the urine though doubt has recently been cast upon this view.[36]

The biochemical effect of digitalis in the heart

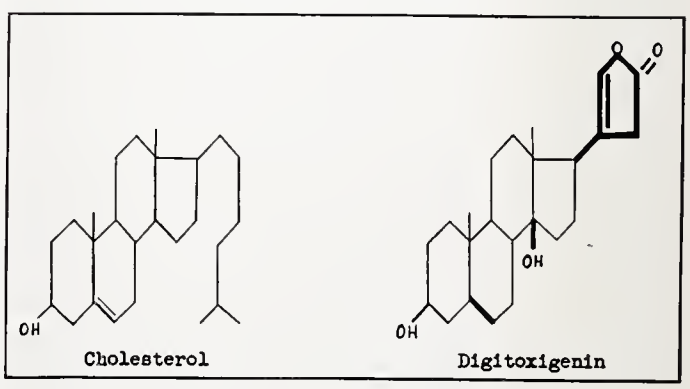


Fig. 21.

muscle is theoretic. It is thought that it diffuses through the semipermeable cell membrane and then splits off the inert sugar. How it then affects myocardial action is not known but it is known that potassium is important in the action of the muscle cell. There is some evidence that cardiac glycosides increase the potassium contents of the muscle cell. In this connection, it is of interest to remember that desoxycorticosterone and related subjects are concerned with the electrolyte balance, especially sodium and potassium, between the intracellular and extracellular fluids.

The pharmacologic effect of the cardiac glycoside is to strengthen the action of the myocardial cell. at the same time it affects depolarization and repolarization, there is a tendency to shorten these processes and thus shorten cardiac systole. In the electrocardiogram, the early onset of repolarization may be noted as shortening of the apolarized phase, and, in advanced digitalis effect, repolarization will follow in the same sequence as depolarization over the heavy left ventricle where the sequence is normally reversed.[36]

There is also an effect of cardiac glycosides on the conduction system of the heart but its essential nature is not understood.

A number of other effects have been described, but their fundamental nature is poorly understood.

CONCLUSION

This presentation should have thoroughly dispersed any doubt regarding the importance of

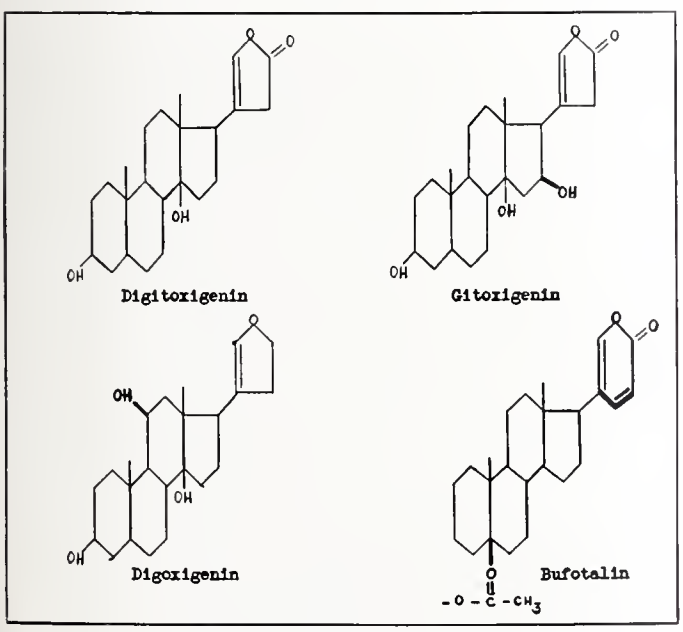


Fig. 22.

derivatives of the cyclo-pentano-phenanthrene ring to the cardiologist.

They are most intimately concerned with the pathogenesis of arteriosclerosis, water balance, electrolyte balance in the various body fluids, kidney function, the maintenance of the blood pressure, nitrogen metabolism, the pathogenesis of the whole group of diseases amongst which rheumatic fever is so peculiarly the concern of the cardiologist. They are further the substances which regulate all of the sexual functions, many of which have an indirect bearing on the cardiovascular system. Especially is it becoming increasingly clear that toxemia of pregnancy is related to so-called essential hypertension and the study of these compounds holds the key to this relationship.

Finally, one of the most important groups of drugs used in the treatment of heart disease has the same chemical foundation.

When it is appreciated that all of this knowledge is relatively new, it is apparent that the great volume of research which presently is being done will result in the revelation of additional and perhaps startling facts. It will be possible for practitioners of medicine to accept and employ these advances as they are placed in their hands; but to obtain the full benefit thereof, it is necessary to have in mind a birds-eye view of of the interrelated nature of this vast new field.

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RESINS IN SHOES, FURNISHINGS ARE BLAMED FOR SKIN DISEASE

Many cases of dermatitis affecting the feet and other parts of the body can be blamed on synthetic resins used in the partial linings of shoes and other manufactured items, according to a Buffalo dermatologist.

Writing in the November issue of the *Archives* of *Dermatology and Syphilology,* published by the American Medical Association, Dr. James W. Jordon said the many instances of dermatitis on the feet and body traced to synthetic resins and their components "make it evident" that these substances are important skin sensitizing agents.

Dr. Jordon is associated with the Department of Dermatology and Syphilology, University of Buffalo School of Medicine.

"Contact with these substances is almost universal," said Dr. Jordon, pointing out that they are widely used in wood finishes, furniture upholstering materials, varnishes and lacquers, steering wheels, handles, musical instruments, toys, games, sporting goods, wearing apparel, accessories and jewelry.

Cases of dermatitis due to direct contact with hair lacquer pads, spectacle frames, garters and wrist watch bands containing these substances are known, said Dr. Jordon, adding:

"It is evident that many obscure cases of dermatitis, in which no clear-cut history of contact is elicited, may be due to these compounds."

In order to establish definitely whether or not a case of dermatitis is due to synthetic resins, Dr. Jordon explained, it is necessary to make patch tests with the actual compound to which the skin has been exposed.

"It is not sufficient in suspected resin dermatitis to test the patient to a sample group of basic resins," he said, adding that "there is no one common factor responsible."

He continued, "Synthetic resins as they are employed are highly complex physical chemical mixtures. They are produced by a large number of manufacturers and there are at least 17 different classes of synthetic resins, each class of which contains many varieties. At least 400 different plasticizers and solvents, as well as colors and other substances, are employed in modifying the properties of the basic resins.

"Further investigation may aid in determining which resins, pigments, and other chemical compounds are harmful and elimination of these may reduce the incidence of resin dermatitis."

Dr. Jordon described his observation of cases affecting the feet in 47 proved instances of resin dermatitis and 29 suspected instances. The suspected cases were those in which complete studies and tests were not made.

He found that inflammation corresponded fairly closely with areas of the skin in actual contact with the substance when the shoe was being worn. The top part of the foot and the toes were most commonly involved with the heels and soles rarely affected.

Of the 47 proved cases, 41 were women in which a quarter to half the linings of the shoes were resins. After discarding the offending shoes healing was usually quite prompt, he pointed out.

U. S. MATERNAL DEATH RATE ESTABLISHES NEW LOW RECORD

For the first time in history, the maternal death rate for a large nation has been pushed slightly below the apparently irreducible minimum of one per 1,000 live births, according to the November 25 *Journal of the American Medical Association.*

This record was set in 1949 by the United States, based on preliminary reports, said the *Journal.* When the 1949 rates for Sweden, Norway, Denmark, the Netherlands and New Zealand become available, one or more of these small countries with a homogeneous population may join the select circle, the publication added.

The new record, it was pointed out, compares with 1.2 maternal deaths per 1,000 live births in 1948 and with 6.2 in 1933. On that basis, the *Journal* concluded that "childbirth has been made quite safe."

In 1949 there were 30 states with rates less than 1.0, two at exactly that level and only 17 above.

"The fact that the chances of an expectant mother surviving the diseases of pregnancy, childbirth and the puerperium are now better than 999 out of 1,000 is truly a story of human and social progress," said the *Journal.* "An examination of the rates for the different states indicates areas in which further improvement can be expected, but it is clear that maternal mortality is no longer a nationwide problem."

The reduction in the death rate from 1933 was attributed to several factors: (1) an increasing percentage of births in hospitals, although improvements in the medical care provided in home births have been pronounced; (2) development of prenatal care; (3) health education; (4) the administration of sulfonamides, antibiotics, whole blood or blood derivatives, and (5) improvement in training in obstetrics.

Unlike the trend in many nations, the number of births attended by midwives in the United States is being rapidly reduced, it was pointed out.

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Clinical Conference

CLINICAL PATHOLOGIC CONFERENCE

Ellis Fischel State Cancer Hospital
OTTO SAPHIR, M.D., *Chicago*

Primary Mucinous Carcinoma With Signet Ring Shaped Tumor Cells of the Breast

History.—(Presented by Richard E. Johnson, M.D., Ellis Fischel State Cancer Hospital, Columbia). The illness of this 26 year old white woman began four months prior to death when she noticed enlargement of the glands on the right side of her neck. This was associated with aching pain involving the neck, right arm and right thorax. Some swelling of the arm developed subsequently. A biopsy of a neck node at an osteopathic hospital was interpreted as "adenolymphocarcinoma." She received an indeterminate amount of x-ray therapy, with slight improvement. Two months prior to admission to the Ellis Fischel State Cancer Hospital she developed headaches which became progressively more severe and two weeks prior to death, nausea, vomiting and photophobia appeared. She was admitted to the hospital on June 8, 1949, in a stuporous state. Examination revealed signs of increased intracranial pressure. There were enlarged, firm lymph nodes on both sides of the neck, and a single discrete node in the right axilla. The latter was excised. Her condition deteriorated rapidly and she expired on June 19, 1949. No primary tumor was ever identified. There were no significant laboratory or x-ray findings. An autopsy was performed.

The section is from the discrete node in the right axilla.

DISCUSSION

OTTO SAPHIR, M.D., Chicago: In this section of a lymph node (fig. 1) there is indisputable evidence of metastatic spread of carcinoma by way of the lymphatics. Carcinoma cells fill the subcapsular, cortical and medullary sinuses. In other areas of the lymph node, extension beyond the sinuses is evident with the formation of sheets and cords of tumor cells. The cells are polyhedral or spheroidal with a faintly acidophilic or basophilic cytoplasm which is generally granular. However, in many areas it contains vacuoles of varying size. Some of these are large with resultant compression of the peripherally disposed hyperchromatic nuclei forming the "signet-ring" cell. The nuclei are sometimes exceedingly large and pleomorphic. Many tumor giant cells are seen. The chromatin is finely reticulated with focal thickenings at the points of intersection of the fibrils. The nucleoli are usually from one to three in number, large and well defined. Atypical mitoses are numerous.

This is an unusual case. If I had seen only the lymph node, I do not know what I would have called it. Fortunately, I received sections of various organs removed at the time of the autopsy. During the preliminary examination of the body, the pathologist noted that there were numerous firm areas in the breast. These were of irregular distribution. One area, however, was distinctive in that it was larger and conformed to the definition of a tumor. May I read to you what I wrote after studying the slides? "From the microscopic sections of all the tissues, it seems clear that this is a primary carcinoma of the breast with metastases in the lung and, among a number of other organs, also in the ovary. At first, it seems to be a diffusely infiltrating carcinoma, apparently arising in the small ducts of the breast," as was seen in the photomicrographs.

"A more detailed examination, however, reveals that some of the individual carcinoma cells have retained the ability of producing a substance, identified as mucin by special stain. In the lymph nodes these tumor cells are large and the nuclei are pushed toward the periphery of the cells producing a signet-ring cell appearance. In other words, it is a primary carcinoma of the breast, mucin secreting, which had produced metastases."

This case is interesting in that this patient was

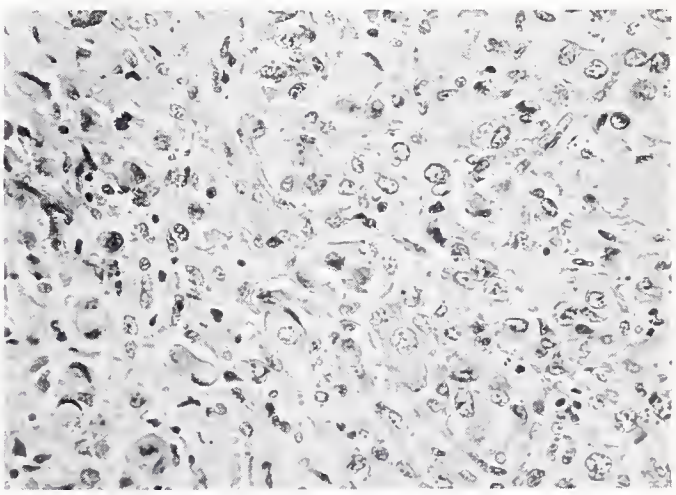


Fig. 1. Metastasis to lymph node. Note a few signet-ring tumor cells.

only 26 years old and the presence of a carcinoma of the breast was not suspected clinically.

The circumspection of the pathologist in this case is highly commendable. If he had been less prudent, he, too, might have failed to find the primary site. I cannot overemphasize the fact that pathologists should conduct a careful external examination at the time of autopsy, and it is of greater significance that the importance of this particular concept be conveyed to the clinician. It has been my experience, and I am certain that of others, that a clinically unsuspected carcinoma of the breast found at autopsy creates much chagrin to the clinician. It is deplorable that in this day and age when everyone

From the 1950 Tumor Seminar held at the Ellis Fischel State Cancer Hospital, Columbia, conducted by Otto Saphir, M.D., Chicago. The remainder of the Seminar will appear in subsequent issues of THE JOURNAL.

is "cancer conscious," a carcinoma is overlooked in such an accessably palpable organ.

Some time ago I was a witness to such an omission. The patient, a 60 year old female, was brought to the hospital with the diagnosis of a myocardial infarct of the anterolateral wall of the left ventricle. The latter was confirmed by electrocardiogram. The patient expired and the cause of death, clinically, was believed to be due to the myocardial infarction. At autopsy, palpation of the breasts disclosed the presence of a primary carcinoma. There were extensive metastases as well. The physician, a cardiologist, defended his omission at the clinico-pathologic conference, in the presence of a large audience, with the following statement: "Well, we are not in the habit of palpating the breasts in every patient with myocardial failure. Our patients would not like it." I consider this a deplorable attitude and welcome this opportunity to express my personal opinion. In these days of specialization, one should not fail to remember the necessity of a systematic and thorough physical examination.

Coming back to this case, this type of carcinoma belongs in the group of mucin secreting or mucinous carcinoma of the breast. In my opinion, there are three different types of mucinous carcinoma of the breast.[1] The first type is a mucinous carcinoma involving the finer ducts with the production of a large amount of mucin and, ultimately, pressure atrophy of the duct structures. If this is complete, recognizable cells will be absent and one will see only large cavities or large circumscribed cystic structures filled with mucin. This is the true mucinous adenocarcinoma. The concept that mucinous adenocarcinoma is usually relatively benign is based upon this type.

The second type is not a true mucinous adenocarcinoma, but primarily a duct carcinoma in which the individual cells produce mucin. In some microscopic fields one may see structures which are characteristic of a duct carcinoma, while in adjacent areas are structures resembling those which I have described in the first type. This is a duct carcinoma with mucinous features and its biologic behavior is similar to that of a primary carcinoma arising from the ducts of the breast.

The third type, the signet-ring cell type of mucinous adenocarcinoma, resembles the case under discussion. It is characterized, microscopically, by well preserved, mucin secreting cells with basophilic or clear cytoplasm and crescent shaped compressed nuclei. Apparently, these cells become isolated from the ducts and acini, invade the stroma, and produce widespread metastases. Morphologically, this type resembles the so-called linitis plastica type of carcinoma of the stomach. Both contain individual tumor cells which produce mucin and a large amount of connective tissue. This is one of the most malignant tumors of the breast. It produces widespread metastases. Almost invariably the bones are involved and often there are metastases to the ovary.[2]

It is interesting that, occasionally, such a metastatic ovarian carcinoma (often called a Krukenberg carcinoma) dominates the clinical picture, simulating a primary carcinoma and for which an oophorectomy, or most likely a panhysterectomy, is performed. In nearly every instance the primary carcinoma is in the stomach; occasionally, however, as in this case, the primary carcinoma may be in the breast.

There are a number of interesting changes in the lungs. There are not only mestastases but also tumor emboli in the pulmonary vessels. The latter also show definite compression by young granulation tissue which, I think, is obviously the result of organization of thrombi caused by the tumor emboli.[3]

This case is an example of a diffusely infiltrating signet-ring cell type of mucinous adenocarcinoma of the breast with metastases throughout the body and particularly in the ovary. These tumors should not be called gelatinous carcinomas because they do not produce gelatin. They are not mucoid tumors because they produce mucin and not mucoid. They certainly are not colloid carcinomas. Only two organs produce colloid—the thyroid and the hypophysis.

Lauren V. Ackerman, M.D., St. Louis: In my opinion, this is an unusual variant of breast carcinoma. I wonder if you might make some statement as to the frequency of this type of tumor? Would you designate it as a signet-ring type or mucinous carcinoma of the breast? Would you say they all had a hopeless outlook?

Dr. Saphir: In the first place, this is a rare type of carcinoma of the breast, perhaps among the rarest types. Several years ago a study was conducted with regard to metastases and it was found that the ovaries were involved in seven out of forty-three cases of primary carcinoma of the breast. In addition, about six cases in the series of forty-three, if I remember correctly, were primary carcinomas of this type. This study made us cognizant of the significance of ovarian metastases, so much so, that now in the presence of signet-ring type of mucinous adenocarcinoma of the breast, we ask the clinician to palpate the ovaries, and often they reply that there is an enlarged ovary.

Morphologically, this type of carcinoma is identical with that seen in the stomach. Therefore, as far as nomenclature is concerned, one may call it either a diffusely infiltrating carcinoma of the linitis plastica type or, better, a mucin secreting adenocarcinoma with signet-ring tumor cells.

Dr. Ackerman: I have seen the same type in the large bowel and it had about the same prognosis—poor.

Dr. Saphir: At the present we are studying three carcinomas of the colon of the same type with metastases to the ovary. Did your cases also have metastases to the ovary?

Dr. Ackerman: I cannot recall whether it did or not.

Jack H. Hill, M.D., Kansas City: We had a case of this type in which there were unusual bone le-

sions consisting of small, hard nodules throughout the cancellous portions. Do you have any knowledge of unusual bone manifestations?

Dr. Saphir: No, I do not remember. It would be very instructive to determine whether an osteoblastic type of lesion, or an osteoclastic type of metastasis, is produced. From your description it seemed an osteoblastic type. Did you classify the metastases of your case as an osteoblastic type of metastasis?

Dr. Hill: Yes. Our patient died after an operation. The primary site had not been discovered clinically. At autopsy there were a few small nodules in the stomach, 1 to 2 mm. in diameter, but no primary tumor was identified. We were amazed to find that the tumor cells in the stomach were identical with those found in the cancellous portion of the bones.

Martin Silberberg, M.D., St. Louis: What about the multinucleated giant cells present in this tumor?

Dr. Saphir: Yes, there were some giant cells but I did not think that they were particularly characteristic. In any case of carcinoma one may occasionally see giant cells.

Dr. Silberberg: I was concerned with the significance of their association with this unusual type of carcinoma.

Dr. Saphir: I do not know if there is any significance.

Henry Pinkerton, M.D., St. Louis: I would like to ask if the picture in the lung was anything like that of lymphangitic carcinoma? We have had two cases with widely distributed mucoid cells in the lung. The primary lesions were difficult to find. In one, the primary lesion was in the stomach. Were the metastases all in the blood vessels or were there any lymphangitic metastases?

Dr. Saphir: There were quite a few lymph vessels involved, particularly peribronchial and perivascular.

Dr. Johnson: Dyspnea was prominent in this patient.

M. D. Wheelock, M.D., Chicago: I wonder how many individuals would still make a diagnosis of primary carcinoma of the breast from that particular lymph node? I do not believe I would do it again. I have been quite lucky in making a diagnosis of carcinoma of the breast, metastatic to the lymph node, despite the absence of a palpable breast nodule. The cells, of course, were much more characteristic than in this case.

It has been my good fortune, due to the courtesy of Dr. Gardner of Northwestern University, to see sections of ovarian tumors sent to gynecologists who were interested, primarily, in ovarian tumors. I have been impressed with the fact that in every set —which comprises about ten to twenty slides— there are at least one or two ovarian metastases, the primary lesion being in the breast. They were not mucin secreting or, if they were, they did not have the characteristics such as you described here. I cannot conceive of the histologic characteristics. If I had to do it over again, I am sure I would make a mistake.

Dr. Saphir: I sympathize with you because I think I would make the same mistake. It is important to know not only the histologic picture, but also to know the origin of the lesion. In other words, one must be equipped with an adequate differential diagnosis. In this particular case, one would have to rule out a lesion in the nasopharynx or, perhaps, a bronchogenic carcinoma. Assuredly, the microscopic appearance alone would not warrant a diagnosis of carcinoma of the breast if all the facts of the case were not available.

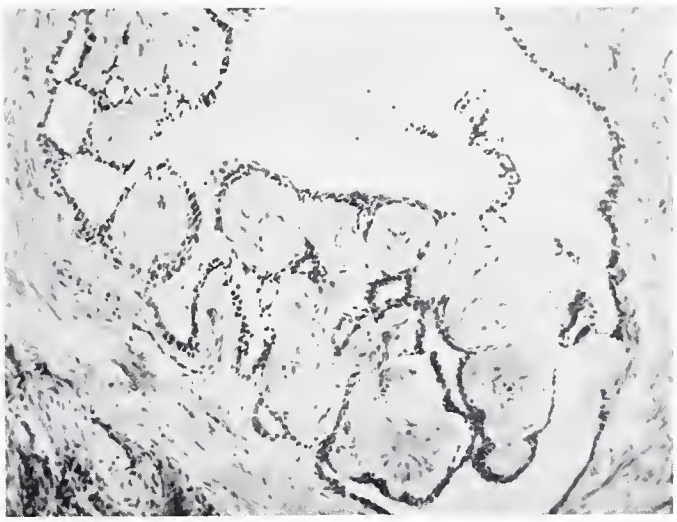


Fig. 2. Intracystic papilloma (fibropapilloma).

E. D. Sugarbaker, M.D., Jefferson City: I think it is important to note the clinical history of this patient and the extremely short course of her disease which was probably prematurely terminated by a brain metastasis. It is probably fair to state, in answer to the question asked by Dr. Hill, that if brain metastasis had not occurred, it seems quite likely that this patient would have gone through the gamut usually seen in young women with skeletal metastases.

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Intracystic Fibropapilloma of the Breast

History.—(Presented by Otto Saphir, M.D., Michael Reese Hospital, Chicago). The patient, a 55 year old white woman, entered the hospital because of a lump in the left breast which she had noticed three months prior to admission. It had grown gradually, increasing to three times its original size. There had been a slight amount of nipple discharge and aching in the breast. The family history was not significant. On physical examination the left breast was slightly larger than the right. A nontender, well circumscribed, freely movable soft nodule measuring 3 by 2 cm. was felt in the outer lower quadrant of the left breast. The overlying skin was freely movable and there was no retraction of the

nipple. Several shotty firm lymph nodes were present in the right axilla. The tumor was removed.

The specimen consisted of three irregular pieces of breast tissue measuring 8 by 3 cm., 5 by 4 cm., and 3 by 3 cm., respectively. In the smaller piece there was a firm, well circumscribed, bulging, somewhat granular nodule. Sections through the other pieces revealed gleaming white surfaces in which an occasional small cyst was noted.

DISCUSSION

Otto Saphir, M.D., Chicago: In this section of the breast (fig. 2), which is the seat of extensive fibrosis, focal hyalinization and calcification, there are numerous cysts, some of which contain a homogeneous, deeply eosinophilic material. The lining epithelium is low cuboidal and arranged in two layers. The periacinar connective tissue is increased in thickness and projects into the cysts elevating the lining epithelium with the formation of variform excrescences. Due to the close proximity of some of these, the opposing layers of ephithelium simulate glandular structures. At times direct continuity with the main lumen is not apparent. The cells are uniform and there is no extension beyond the basement membrane. .

My diagnosis is an intracystic papilloma of the fibrous type, the complete diagnosis being intracystic fibropapilloma of the breast. As a preamble to the discussion of the next three cases, I would like to emphasize that papillary tumors of the breast must be divided into two groups. In the first, the papillary excresences are part of a more generalized disease of the breast, such as Schimmelbusch's disease, or cystiferous hyperplasia, or chronic cystic mastitis, or whatever one may choose to call it. In the second group the papillary tumors constitute the principal lesion and are not associated with any other major disease of the breast. The following cases are examples of the latter type only.

This case is an intracystic papilloma of the breast. Although there was a discharge from the nipple, there was no bleeding. The outstanding histologic findings are the dilatation of the ducts with formation of cysts and the presence within these cysts of a connective tissue stalk, or several stalks, covered by duct epithelium. Sometimes two adjacent or opposing stalks, each surrounded by epithelium, are in close approximation. The two rows of opposing lining cells may partially fuse and thus simulate glandular formations.

The histogenesis is apparently initiated by a proliferation of connective tissue with growth into a dilated duct or cyst. During this process the epithelium is also carried into the lumen of the duct or cyst. If the stalk is broad (as is seen in this particular instance) the papilloma may be called a "fibropapilloma"; if the stalk is narrow and a number of pseudoglandular structures are formed, it may be classified as a "pseudoglandular" papilloma.

These tumors are benign. They may be multiple. A hemorrhagic discharge from the nipple is unusual. Because there is an increase in, or a new formation of, connective tissue, these lesions usually can be palpated clinically. Of the papillomas of the breast this type, in my opinion, is the most frequent. Among fifty-one papillomas which I have personally studied, about forty-two were representative of this type.[1]

Pictures of this particular case show a cyst into which projects this mass of connective tissue covered by the duct or cyst lining cells. Now, one can easily imagine that if more connective tissue were present in this region, then these two papillae would approximate each other and simulate an intracanalicular fibroadenoma. This picture also illustrates the ingrowth of papillae into the cysts. The paucity of nuclei in the papillae is evident. I repeat that the papillae are broad; that this is a fibropapilloma of the breast, a benign lesion, which may be multiple but does not require either a simple or radical mastectomy.

Henry Pinkerton, M.D., St. Louis: It seems to me that in a good many cases of chronic cystic mastitis, one can see this change in a minor degree. One will see small intraductile papillomas and small microscopic adenofibromas. I wonder if this is merely an exaggeration of that. I wonder if there is any real basic difference between this and chronic cystic mastitis?

Dr. Saphir: You are quite right. In the preamble I defined my terms and stated that the lesions may occur alone or in a breast, the seat of chronic cystic mastitis. Clinically, they appear as well circumscribed tumors. There is no doubt but that any type of papilloma may occasionally occur in a breast with diffuse disease.

Leo Lowbeer, M.D., Tulsa, Okla.: Would not the age of this particular patient who was 65 years old rather exclude the possibility of a diffuse process such as fibrocystic disease which, in my experience, invariably occurs at an earlier age?

Dr. Saphir: Fibrocystic disease may be found in the older age groups but begins more often in the younger age groups.

Hilliard Cohen, M.D., Kansas City, Mo.: Dr. Saphir, might not a fibroadenoma undergo cystic changes and simulate a picture like this?

Dr. Saphir: Yes, it might, but then one would also expect degeneration of the lining epithelium and of the stalk. In this case there is a definite cystic structure and the adjacent cells are well preserved. There is no evidence of degeneration.

Henry Allen, M.D., St. Louis: I wonder if this might be the same as a fibropapilloma of the ovary in which the fibrous tissue pushes out, enclosing little cysts around the cortex of the ovary. Are there fibropapillomas of the ovary?

Dr. Saphir: Yes. As a matter of fact, the term used is "fibrocystoma" of the ovary, although it may also be called a "fibropapilloma."

1. Saphir, O., and Parker, M. L.: Intracystic Papilloma of the Breast, Am. J. Path. **16**:189-210, 1940.

Pseudoglandular Type of Intracystic Papilloma

History.—(Presented by Otto Saphir, M.D., Michael Reese Hospital, Chicago). This 71 year old white woman entered the hospital because of a lump in the right breast which had been present for two months. For the last two years she had been treated by her physician for hypertensive and arteriosclerotic heart disease and mild diabetes. Six weeks prior to this admission she developed acute pulmonary edema and was hospitalized. A diagnosis of an atypical anterior wall infarct was made. Nothing had been noted in the breast at that time. Physical examination revealed a well developed, well nourished woman in no apparent distress. The breasts were pendulous. A hard, nontender mass, fixed posteriorly, was felt in the upper outer quadrant of the right breast. The diagnosis was a tumor of the breast, probably carcinoma. At operation, the mass measured 2.5 cm. in diameter. Because of the patient's condition, a simple rather than a radical mastectomy was performed. The patient was discharged, having sustained the surgical procedure smoothly.

The specimen consisted of skin and underlying breast tissue measuring 5 by 3.5 by 2 cm. Within the breast tissue was a cystic area measuring 2.5 cm. in diameter and filled with papillary excrescences. There was no evidence of invasion of the surrounding breast. The remainder of the breast measured 16 by 11 by 4 cm. The nipple showed no change. On section, the ducts were diffusely dilated.

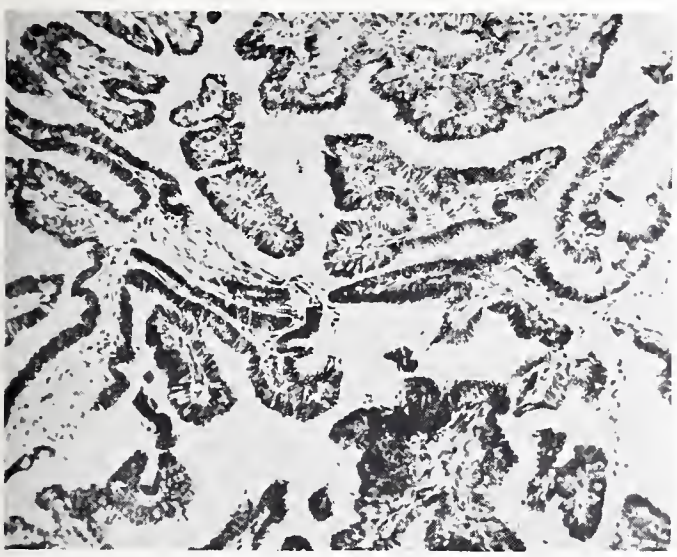


Fig. 3. Intracystic papilloma, pseudoglandular variety.

DISCUSSION

OTTO SAPHIR, M.D., Chicago: In this section of the breast (fig. 3) there are two large cysts surrounded by dense connective tissue which extends directly into one of the cysts, subdividing it into two compartments. Lymphocytes and pigment laden histiocytes infiltrate the connective tissue. Projecting into the lumen of the cysts are numerous, thin, delicate stalks arranged in an intricate anastomosing and branching pattern and covered by a double layer of columnar epithelium. As a result of this complicated series of infoldings, the epithelium tends to form glandlike structures. Many appear to be completely isolated from the lumen while in others continuity is still traceable. The basement membrane is intact and the cells are uniform in size and shape.

I find it interesting that so many who have seen this slide recommend radical mastectomy. The weighty decision that a breast tumor is a carcinoma carries with it, of course, the implication that a radical mastectomy is indicated. As a pathologist, one is confronted with this problem daily. It has been my policy to say, when in doubt, that I just do not know whether the lesion is malignant or not. The breast can always be removed at a subsequent date after the paraffin sections have been studied; but once removed, it cannot be replaced.

I do not think that this is a carcinoma but is an intracystic benign tumor of the breast. The outstanding characteristics are the long and thin finger-like papillae. The close proximity of the epthelial cells covering the various papillary excrescences is easily noted. The subsequent partial fusing with the formation of pseudoglands is identical with that seen in the previous case. It should also be noted that the cells of these pseudotubular or pseudoglandular structures (and I think this is essential in the differential diagnosis) are identical with those lining the ducts or cysts in which the tumor is found. They often are arranged in two layers. There is no morphologic evidence of malignancy. There is no invasion. This papilloma is classified as intracystic pseudoglandular type of papilloma. Clinically, this 71 year old white woman had noted the lump in the breast. Although there was no discharge from the nipple, pigment laden macrophages can be noted in a number of the sections.

Here, again, one sees a cyst containing papillary structures, consisting principally of connective tissue and lined by epithelial cells. As a matter of fact, in this area one can see how the cells which line the cysts also extend over the papilla. As in the previous case the primary lesion is probably the result of a stimulation of the connective tissue which carries the lining epithelium into the cyst. Areas like these fuse, resulting in pseudoglandular structures. This is an intracystic papilloma of the pseudoglandular variety, a benign tumor.

Although not represented in this collection, the (true) glandular papilloma resembles the pseudoglandular type. It is probably the result of a hyperplasia of acini or duct structures, with secondary extension into the dilated ducts or cysts. It differs from the fibropapilloma[1] in that the core is composed primarily of glands rather than fibrous tissue. It is easy to differentiate between the pseudoglandular papilloma and the true glandular papilloma. In the former, the lining cells are identical with those of the ducts of the breast; in the latter, the cells are similar to those of the acini. In this

case, what were the reasons for calling this lesion a carcinoma of the breast?

Louis A. Schneider, M.D., Ft. Wayne: Dr. Saphir, I would like to have your views on the pathogenesis of the cystic dilatation which occurs in these cases. So often in cystic disease of the breast there is epithelial hyperplasia as well as connective tissue proliferation. Where do you draw the dividing line between cystic disease and these intracystic papillomas?

Dr. Saphir: The dividing line is the diffuseness of the process seen in chronic cystic mastitis. The difference lies in that the intracystic papillomas are single lesions confined to one area; in chronic cystic mastitis, a diffuse process, there are intraductile cellular proliferations of various sorts, including papillomas. There may be, perhaps, a common underlying factor as yet unknown.

Henry Allen, M.D., St. Louis: How do you interpret the epithelial-like cells out in the fat?

Dr. Saphir: I do not think that this is evidence of carcinoma. I think the cells are normal duct structures of the breast, or fatty breast. Remember, the woman is 71 years old!

Lauren V. Ackerman, M.D., St. Louis: I think that this lesion, while it is quite common, is more frequently misdiagnosed than almost any other lesion of the breast. In my experience, nothing has happened to those patients who have had only simple wedge resections. It requires much more courage for a pathologist to call a proliferating lesion benign than to say, "I think it might be cancer." In the latter instance a radical mastectomy is performed, the patient may be cured, and the pathologist is absolved of responsibility. However, I think it behooves the pathologist to take this responsibility on the basis of his knowledge of the outcome of the proliferating intraductile papillomas. I think this one is perfectly benign.

Dr. Saphir: I might mention that we have followed the cases which I have shown you thus far. To date nothing has happened. Mastectomies were not performed.

1. Saphir. O., and Parker, M. L.: Intracystic Papilloma of the Breast, Am. J. Path. **16**:189-210, 1940.

Transitional Cell Papilloma

History.—(Presented by Otto Saphir, M.D., Michael Reese Hospital, Chicago.) This 67 year old white woman entered the hospital because of cysts and swelling of the right breast of six to seven months' duration. She had noticed a soft "bleb-like" area on her right breast about six months ago, which was tender on pressure but otherwise was not painful. There was no discharge from the nipple. Gradually the mass increased in size but the patient disregarded it until about one to two months before admission when she noticed that the entire breast was enlarged. The family history was noncontributory. On physical examination the right breast was considerably larger than the left. It was replaced largely by a semifluctuant, nontender multinodular mass measuring 10 cm. in diameter. There was slight fixation of the overlying skin and the nipple was retracted. No axillary lymph nodes were felt. A radical mastectomy was done.

The breast measured 15 by 11 by 6 cm. A thick yellow material could be expressed from the nipple. In the breast were two large, thick walled cysts, each measuring 5 cm. in diameter and containing bloody fluid. Projecting from the wall of one of these were soft pink excrescences which appeared to extend into the surrounding tissue. Several lymph nodes were found in the axillary tissue.

DISCUSSION

Otto Saphir, M.D., Chicago: This section (fig. 4) shows the wall of a cyst from which project numerous thick papillary excrescences. The stalks are broad, edematous and sometimes poorly, and other times richly, vascularized. The covering epithelium consists of superficial rather low columnar cells arranged perpendicular to the basement membrane. These cells have vesicular, often oblong, nuclei. The deeper layer is composed of more spindle shaped cells. They vary considerably in thickness and often project into the subjacent tissues forming irregularly circumscribed collections of cells. That these cells have likewise proliferated upward with elevation and infolding of the columnar cells is evidenced by the formation of alveoli which are lined by columnar epithelium. In some areas there are acini lined by cuboidal cells. No evidence of invasion or cellular malignancy is seen.

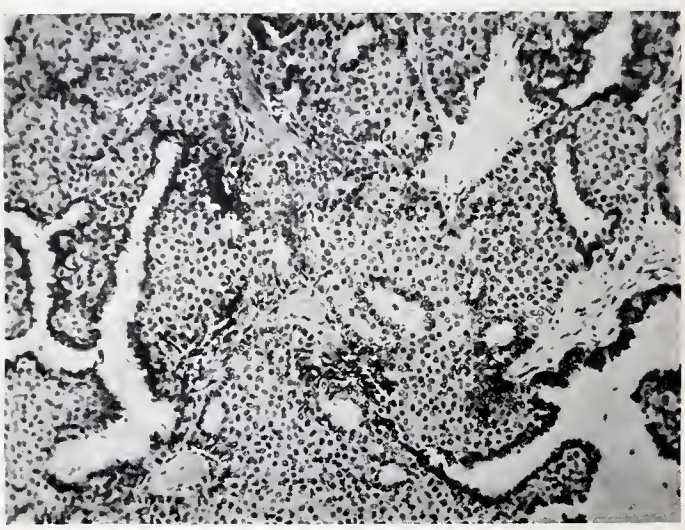


Fig. 4. Intracystic papilloma, principally transitional type.

This is a more difficult tumor than the foregoing one. It resembles the last two cases in that it is a benign intracystic papilloma of the breast, but differs in one important aspect. Microscopically, in most of the fields, there is a proliferation of epithelial cells which do not vary in size, shape or staining quality. Often only nuclei are present and the cytoplasm cannot be clearly seen or, at least, there are no distinct cellular membranes. The nuclei are vesicular, sometimes slightly elongated, and resemble morphologically (and this is the important feature) those seen in certain papillary tran-

sitional papillomas of the urinary bladder. Here and there masses of these cells are grouped together; the most superficial layer of epithelium, which is low cuboidal, is similar to that lining the larger ducts of the breast. Throughout the sections, and often in the midst of these tumor cells, there are a number of glandular structures. The essential features, therefore, are transitional cell-like epithelial cells and pseudoglandular structures.

The pathogenesis, in my opinion, is as follow: The papilloma arises from a proliferation of the cells which are closely related to the deeper layer of the duct epithelium. The proliferation of the tumor cells is apparently not uniform and here and there stalks are formed. As a result the more superficial lining cells are carried into the lumen of the cysts and give rise to the pseudoglandular structures.

During the proliferative phase numerous small blood vessels accompany the papillary growth. When these vessels rupture, hemorrhage occurs into the cyst or duct and the clinical sign or symptom of bleeding from the nipple occurs.

The term "transitional cell papilloma" is used to denote not only this type of cells of the tumor but also to point to the similarity in prognosis between it and that found in the urinary bladder.[1] We have watched a number of such papillomas closely and have found that they are more frequently multiple than any other type. Recurrences are common and often show morphologic evidence of carcinoma. In other words, here is a tumor of the breast—a papilloma—which I would like to call a papilloma of the transitional cell variety. It is never invasive but grows within the duct of the cyst. Because of the large number of cells and the paucity of stroma, it is soft in consistency and cannot be palpated. The only complaint elicited, at times, from the patient is a hemorrhagic discharge from the nipple.

In the photomicrograph of the section, there is the wall of a cyst from which project numerous, thick papillary excrescences. The stalks are broad, edematous and sometimes poorly and sometimes richly vascularized. The covering epithelium consists of a superficial layer of columnar cells arranged perpendicularly to the basement membrane and a deeper layer composed of cuboidal cells. The latter vary considerably in thickness and often project into the subjacent tissues, forming irregularly circumscribed collections of cells. That these cells have likewise proliferated upward with elevation and infolding of the columnar cells is evidenced by the formation of alveoli which are lined by columnar epithelium. In some areas there are acini lined by cuboidal cells. There is no evidence of invasion or cellular malignancy and, therefore, it cannot be called a carcinoma.

I should like to digress at this point, if I may, to cite a personal experience. Whenever I find it difficult to decide whether a lesion is benign or malignant, I invite a medical student to study the slide with me. I tell him that it is a carcinoma. Invariably, he will ask questions more or less of this nature: "Well—I was told that in a carcinoma there is invasion, mitoses, anaplasia and tumor giant cells. Would you show me these?" It has been my experience that if I could not convince a medical student that the lesion, on morphologic grounds, was a carcinoma, it probably was not a carcinoma.

M. PINSON NEAL, M.D., Columbia: Dr. Saphir, how is one to differentiate this lesion from a true endothelioma with pseudogland formation? How can one call it a benign tumor when there are lymph vessel permeations in the capsule? The slide I had revealed three lymph vessels completely packed and filled with tumor cells.

DR. SAPHIR: In answer to the first question, "Why is this not an endothelioma?" I do not know. I have never seen an endothelioma of the breast. In my opinion these cells resemble epithelial cells. In answer to the second question about involvement of the lymphatics, I do not see how one can rule out a small duct structure. In a hematoxylin and eosin preparation it is difficult to differentiate a small duct from a lymph vessel.

DR. NEAL: The lymph vessels are actually in the capsule; they are not within the tumor.

DR. SAPHIR: If you have seen lymph vessel involvement, then it is a carcinoma rather than a transitional cell papilloma. I did not see definite lymph vessels containing tumor cells. Dr. Ackerman, what do you think of this tumor?

LAUREN V. ACKERMAN, M.D., Columbia: In further reviewing this tumor (January 1949) I would agree with Dr. Saphir that this is not a carcinoma. I was much interested in this particular neoplasm because, as I recall, in your article on your group of papillomas, this was the rarest form. I would be interested in how many instances of this type there was actual invasion and, in this group, how many developed actual metastases? Have there been any cases in which simple excision was done with a follow-up of the patient? In those cases which you followed, has anything happened?

DR. SAPHIR: Yes. Unfortunately, it has. The patient returned with metastases in the lymph nodes and a recurrence, or tumor, in other portions of the breast. I have never seen it in any of the other papillomas. I should like to stress again its relationship to the primary papilloma of the urinary bladder, which, morphologically at least, is a benign tumor, but which will almost invariably recur. The Registry classifies such tumors as carcinoma, Grade I. If I may, I would like to call this tumor a carcinoma, Grade I, rather than a papilloma, although on morphologic grounds it is a papilloma.

DR. ACKERMAN: How many cases have you seen in which metastases developed?

DR. SAPHIR: I cannot give you an exact figure.

F. P. E. BORNSTEIN, M.D., Herrin, Ill.: Dr. Saphir, would you consider a simple mastectomy sufficient treatment for this tumor?

DR. SAPHIR: If a surgeon can convince himself that pressure upon only one quadrant of the breast

causes a hemorrhagic discharge from the nipple, I would think it adequate to do a wedge resection. In this case I would recommend a simple mastectomy.

Dr. Ackerman: The question often arises whether an individual breast lesion is benign or malignant, or whether it is almost malignant. I try to answer the question, if I can, with either a "yes" or a "no." Experience has shown that a simple mastectomy fails to remove all of the breast parenchyma.

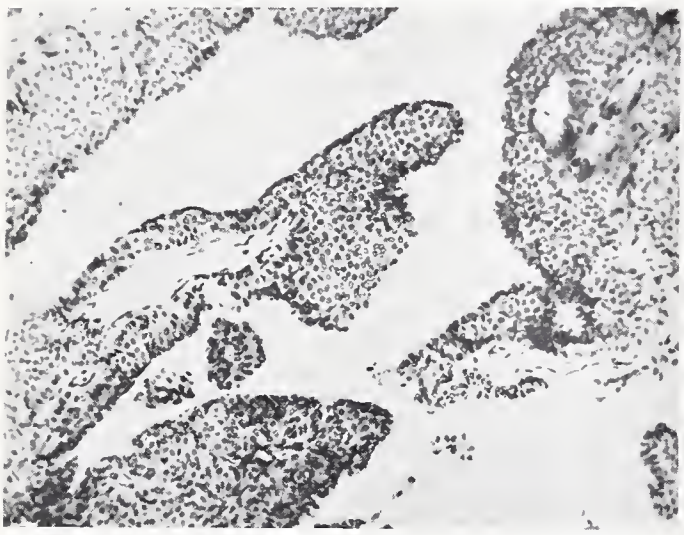


Fig. 5. Intracystic papilloma, principally transitional type.

In addition, if a simple mastectomy is done for a suspicious lesion which, subsequently, proves to be true invasive carcinoma, one is then in a terrible fix! First of all, in the subsequent radical mastectomy the previous operative field must be avoided by a wide excision, otherwise the chances of local recurrence are increased. I would say that it is either everything, or it is nothing. Either the pathologist calls the tumor malignant and a radical mastectomy is done, or he calls it benign. In my opinion, a simple mastectomy is a sort of halfway compromise with the situation. In the group of cases which we followed, local recurrence was common despite the fact that the carcinoma was small and a simple mastectomy had been done. The prognosis in this group was poor.

Dr. Saphir: Of course, that is the ideal answer, if one can give such an answer. However, there are tumors which, morphologically, are benign but biologically are not; and a patient with a hemorrhagic discharge from the nipple may have no palpable tumor. What would your answer be to the surgeon's query, "What shall I do?" In this instance, there was a soft, bleblike area noted by the patient six months prior to operation, but no tumor.

The multiplicity of these transitional cell papillomas of the breast may be explained either on the basis of multicentricity of origin or by implantation of tumor cells in neighboring ducts. Such implants, *per se,* are not necessarily evidence of malignancy, but they may be compared to tissue culture growths and to certain implantations on the peritoneal surface.

Most instances of bleeding from the nipple signify an intraductile proliferation of epithelial cells with rich vascularization. Such proliferations of epithelial cells may be found in so-called chronic cystic mastitis or Schimmelbusch's disease, in intraductile papillomas and in intraductile carcinoma. In Schimmelbusch's disease, or whatever one may call it, a lesion can easily be palpated in the breast and often multiple dense areas are noted. A carcinoma is also easily palpated and often presents characteristic features. However, the intracystic papilloma of the transitional cell variety often cannot be palpated. If one can rule out a blood dyscrasia, vicarious menstruation, rare vascular tumors and hamartomas, then the bleeding nipple, in the absence of a palpable lesion of the breast, is the result of a transitional cell type of papilloma. Because of the foregoing and because the tumor cannot be palpated, it seems reasonable to me that a simple mastectomy, with all its faults, should be done.

Perhaps, in the future, the demonstration of tumor cells within the discharge of the nipple might enable a correct diagnosis to be made before operation. I am going to show some examples. It might also be possible in the future that, if a Huggin's test is done, a more definite diagnosis might be made.

This is a Papanicolaou stain (fig. 5) of a discharge of the nipple. The patient proved to have a transitional cell papilloma of the breast and not a carcinoma. This is a photomicrograph made from a smear taken from the secretion from the nipple and stained according to Papanicolaou. The patient had a transitional cell carcinoma of the breast. In this case we actually made the diagnosis of carcinoma rather than papilloma on the basis of cells. There is a large clump of cells which I called malignant tumor cells. A radical mastectomy was done and the lesion proved to be a carcinoma. The thermocoagulability test of the serum which was perfected by Huggin has been used in our laboratory in conjunction with breast biopsies. Of twenty-four carcinomas of the breast, twenty-one gave positive and three negative tests. The false negative cannot be explained. I would like to know if anybody has ever studied Huggin's test in association with papillomas of the urinary bladder?

Martin Silberberg, M.D., St. Louis: Dr. Saphir, I wonder whether you or anyone else has had experience with the results of the phosphatase reaction in regard to breast cancer. Seligman and coworkers found differences in the outcome of the reaction in benign and malignant mammary tumors respectively.

Dr. Saphir: I do not know anything about it.

Dr. Silberberg: The aforementioned investigations have been published in the *Journal of the National Institute of Cancer,* 1948-1949.

Henry Pinkerton, M.D., St. Louis: Do I understand that one differentiates by cytologic studies be-

tween the transitional cell carcinoma and transitional cell papilloma in the breast?

Dr. Saphir: Yes, I would like to; I cannot do it yet.

Dr. Pinkerton: In the cases which metastasized, was there invasion at the base of the pedicle of the tumor, or did they metastasize without showing any invasion of the breast itself?

Dr. Saphir: They did show invasion of the breast.

Dr. Pinkerton: In the case of bladder tumors, I have not been convinced that the degree of cytologic malignancy is any good indication of the prognosis. I have seen some that were quite anaplastic and yet went for fifteen or twenty years. So, I wonder if purely cytological observations are going to tell one whether it is benign or malignant?

Dr. Saphir: I agree with you. As a matter of fact, I have studied a series of papillomas of the urinary bladder and I believe that the anaplasia often is no indication of the degree of malignancy.[2] Invasion of the prostate determines the development of metastases. Variation in the size of nuclei and anachromasia in urinary tract tumors are not sufficient criteria for a basis of the degree of malignancy.

Dr. Ackerman: Why not ask some of the surgeons whether they can feel intraductile papillomas? I always thought one could find them at some time or another.

John J. Modlin, M.D., Columbia: In my rather limited experience with bleeding from the nipple at this institution, I have gained the distinct impression that if one is persistent in the examination of the breast, one can localize the site of bleeding in nearly all cases. In many instances, a small tumor can be palpated at the site where pressure causes the nipple to bleed. For this reason, we have usually performed only local excision or, at most, wedge resection of a quadrant of the breast. To date, none of these patients has returned with frank cancer of the breast or evidence of distant metastases. As Dr. Ackerman emphasized, those cases in which simple mastectomy was performed and in which carcinoma was found in the operative specimen, subsequent radical mastectomy was technically much more difficult. An attempt should be made to circumscribe the entire previous operative field. In one patient at the Ellis Fischel Cancer Hospital simple mastectomy was followed by a radical mastectomy and it was necessary to excise a large amount of skin from the chest wall with immediate grafting of an unnecessarily large area.

William W. Tribby, M.D., Memphis, Tenn.: Some of our surgeons have been able to insert a probe into the duct from which the blood came. Using the probe as a guide in their dissections, they have, in several cases, successfully located intraductile papillomas.

E. D. Sugarbaker, M.D., Jefferson City: I think that although a tumor cannot be felt, the duct containing the papilloma can be localized on careful palpation. And if the surgeon is not too persistent, he can find it again at the time of operation. Our practice has been not to dissect out a solitary duct, but to do—what I consider an innocuous procedure even from the cosmetic standpoint—a wedge resection of the breast. If the pathologist then says that the process is not limited to a single duct but is present in a number of ducts, a simple mastectomy is done. On one occasion, during my absence from the Ellis Fischel State Cancer Hospital, a resident did a radical mastectomy for a bleeding nipple in which there was no palpable mass. We were gratified when Dr. Ackerman found carcinoma in at least one site and, I think, in several sites in that particular breast. If a carcinoma is found in the surgical specimen from a simple mastectomy, and it is not impossible to find, then one goes ahead and does a radical mastectomy.

Dr. Pinkerton: I would like to ask, Dr. Saphir, whether you think the radiologist has much to offer by injection of radioopaque substances and taking x-rays for the purpose of outlining the ducts?

Dr. Saphir: I have had some experience but from what I have seen, I would not think it a good procedure.

1. Saphir, O., and Parker, M. L.: Intracystic Papilloma of the Breast, Am. J. Path. **16**:89-210, 1940.
2. Saphir, O.: Certain Aspects of Primary Carcinoma of the Urinary Bladder, Urol. & Cutan. Rev. **48**:552-554, 1944.

Intracystic Papillary Carcinoma

History.—(Presented by Otto Saphir, M.D., Michael Reese Hospital, Chicago). This patient, a 53 year old white woman, had had a lump in the right breast for fourteen years. It had caused her no discomfort except for pain in cold weather. About two years prior to entry to the hospital it had begun to grow in size and she noticed for the first time a reddish-yellow discharge from the nipple. She was a known diabetic under treatment for many years. Fourteen years previously she had had a hysterectomy for tumors, an appendectomy and the removal of a cyst of the breast. On examination the breasts were large and pendulous. There was a round, indurated, tender, fixed area measuring 5 by 7 cm. at the medial margin of the nipple. the overlying skin was freely movable. In the lower outer quadrant there was another mass measuring 6 by 7 cm.; it was freely movable, soft and nontender. No axillary lymph nodes were felt. At operation two separate masses were found. A radical mastectomy was performed.

The biopsy specimen consisted of an irregular mass of yellow tissue measuring 8 by 8 by 6 cm., in the center of which there was a poorly circumscribed, firm, granular, gray and hemorrhagic mass measuring 3.5 cm. in diameter. At one margin there were several small cysts filled with clear brown fluid, the largest measuring 1 cm. in diameter. Presented separately was a breast, measuring 22 by 13 by 7 cm. Extending from the nipple was a recent, loosely sutured incision measuring 8 cm. in length, marking the site of the biopsy specimen. A dilated duct was encountered 1 cm. below the nipple; this was filled with a papillomatous mass measuring

7 mm. in diameter and 1 cm. in length. Consecutive sections of the breast revealed numerous cysts filled with brown fluid, and small islands of pinkish gray tissue isolated by large amounts of fat tissue. The attached striated muscle showed no masses. In the axillary tissues there were two lymph nodes measuring 7 mm. in diameter; these were soft and pink.

DISCUSSION

Otto Saphir, M.D., Chicago: Immediately subjacent to the main duct of the breast is a large cyst

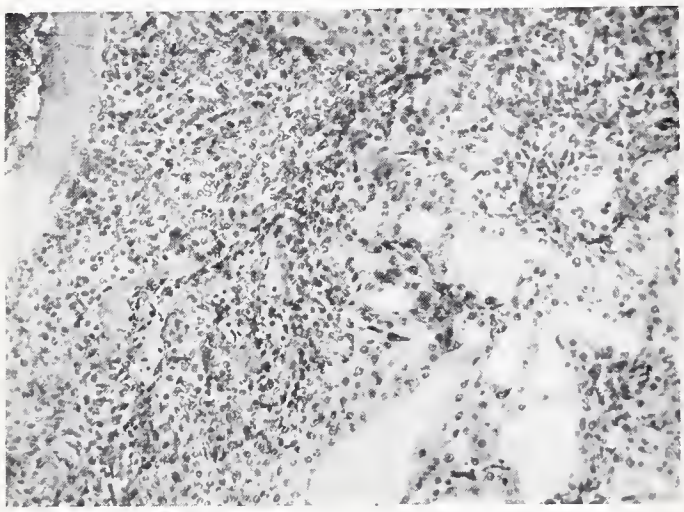


Fig. 6. Intracystic papilloma.

(fig. 6) filled with an intricately branching sessile papilloma. The stalks are broad and composed of thick, hyalinized connective tissue which seems to compress the enclosed small glands. The cells covering these stalks are morphologically similar to the cuboidal cells of the ducts. They are arranged in disorderly masses and glands of variable sizes. There is a pronounced lack of cellular uniformity. The nuclei vary in size and shape; some are hyperchromatic and pyknotic. Mitotic figures are occasionally seen. There is extension beyond the basement membrane into the periductile connective tissue, as well as into the stalks. In addition, there are groups of glands which bear no resemblance to those described above. The lining cells are large and columnar with abundant pale, granular cytoplasms. The nuclei are pleomorphic and some often reach giant proportions.

I think this is an example of an intracystic papillary carcinoma. The tumor cells resemble those seen in the transitional cell papilloma with the exception that there is anaplasia, there are atypical mitoses and there is evidence of invasion. In addition, the tumor is multicentric. There are many dilated ducts filled with hemorrhagic brown material and cysts filled with tumor masses and bloody material. Grossly, the main tumor is hemorrhagic.

An interesting side issue is the peculiar glandular structures lined by pale-staining (in the hematoxylin-eosin stain) epithelial cells which are larger than those of the ducts or acini. These are the so-called "blue" cells, "large" cells, or sometimes "Wasserhelle" cells according to Krompecher. Their cytoplasm is well outlined and their nuclei are hyperchromatic. Krompecher,[1] who first described them, considered them to be misplaced sweat glands. Because of my interest in these structures, I have examined numerous sections of breasts removed from infant females but have never been able to convince myself of their presence. They are commonly seen in chronic cystic mastitis and in other diseases of the breast, particularly in connection with papillomas.

Lauren V. Ackerman, M.D., St. Louis: I had more trouble with this one than with any other, but I ended up by writing it down as benign. But those two nodes were negative, is not that correct?

Dr. Saphir: Yes.

Dr. Ackerman: I think this is certainly the most debatable one; I would not argue too strongly about it.

Dr. Saphir: And what would you have recommended that the surgeon do?

Dr. Ackerman: In this one I agree with you. This is the one in which there was tremendous doubt; I do not feel flatfooted about this diagnosis.

Dr. Saphir: Any other questions or argument? Then I assume that all agree that this is a papillary carcinoma.

1. Krompecher, E.: Zur Histogenese und Morphologie der Cystenmamma (Maladie kystique Reclus, Cystadenoma Schimmelbusch, Mastitis chronica cystica König) des intrakanalikulären Kystadenoms und der Kystadenokarzinome der Brustdrüse. Beitr. z. path. Anat. u. z. allg. Path. **62**:403-472, 1916.

REPORT NEW METHOD TO PREVENT HEMORRHAGE IN HEART SURGERY

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*Pitt, C.K.: *The Art and Science of Artificial Infant Feeding, J.M. Asso. Ala. 19:101 (Oct.) 1949.*

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Case Report

PERFORATION OF SIGMOID COLON BY INGESTED FOREIGN BODY

HENRY K. BAKER, M.D.
MOBERLY

SPONTANEOUS perforation of the bowel wall by an ingested foreign body is an unpredictable and rare occurrence. Too rare to be considered surgically in the preoperative diagnosis, it should, however, receive definite consideration at the operating table in the search for the cause of an unexplained peritonitis or abscess.

CASE REPORT

W.J.B., aged 51, railroad wreck foreman, first noted abdominal pain about 10 p.m., January 28, while at work. Finishing at 3 a.m., he went home still suffering, returned and worked again for a few hours later in the morning of January 29. He took a laxative about noon and ate a little food that evening. Intermittent cramping continued that night with sweating and sharp pain high in the abdomen. Seen by his family doctor forty hours after the onset, he was sent to the hospital with a diagnosis of peritonitis. On admission, temperature was 99.6 F., pulse 96, blood pressure 112/76. The family history disclosed that his mother had died at the age of 51 of cancer of the colon which was misdiagnosed as a colitis. The patient's past history showed an operation for appendicitis twenty-two years before, renal colic with passage of stones and hyperthyroidism treated by surgical removal of most of the thyroid gland. Careful questioning showed that during the last two months he had felt that his bowel had not been emptying just right and had been taking an occasional laxative.

Admission diagnosis was bowel obstruction due to adhesions from the previous appendectomy and conservative measures were inaugurated. Twenty-four hours later, the patient was worse so operation was advised and undertaken.

A generalized peritoneal reaction was found. Adherent loops were freed under the impression that this was a bowel obstruction related to old adhesions. In the pelvis there was found a large mass involving the sigmoid colon and the diagnosis was changed to colon tumor of undetermined type. Further examination revealed a small hard object projecting from a 2 mm. sinus in the tumor. This turned out to be the rib bone of a chicken, with sharp points, measuring 31 mm. in length and slightly curved. Exteriorization of the loop involved showed it to be the distal sigmoid a few inches proximal to the rectum. The abdominal wall was closed with drainage.

The postoperative course was stormy. On the seventh day, thrombophlebitis of the right leg was noted. The exteriorized loop of bowel sloughed away. The distal end retracted into the pelvis and the proximal end formed a fistula. The skin wound healed around it until there was merely a small opening in the old abdominal incision through which the intestinal stream escaped. The patient's condition showed improvement and, the first week of March, he was prepared for re-anastomosis using the plan outlined by Karl Meyer.[52]

On March 6, thirty-five days after the original operation, the abdomen was opened through a transverse incision and the proximal and distal loops of the sigmoid were anastomosed according to the open technic described by Meyer.[53] The postoperative course was again stormy with one embolic episode, bilateral lower limb phlebitis and wound abscess, but fortunately the anastomosis did not break down and on March 11, the fifth day, gastric suction was discontinued, and on March 12, the bowels acted for the first time. The patient returned to work on June 1.

The factor which led to the exteriorization of the bowel loop was the feeling that the chicken bone arrest was caused by a tumor. If a tumor or diverticulum was the cause of such arrest, the evidence was lost when the exteriorized loop sloughed away.

Barium visualization of the colon three months after anastomotic surgery showed no stenosis and also no evidence of sigmoid or other colon diverticulum.

This subject has not attracted great attention. A recent collective review[51] of diseases of the colon failed to mention it. There are now some 110 cases reported in the literature, probably more in the less accessible journals, and, yet, the average textbook on diseases of the colon and rectum will contain only a few lines on this subject. In a review of the literature, sufficient cases were found to make possible some definite statements.

Carp[13] reported a series showing that 80 per cent of ingested foreign bodies pass through the intestine without causing any trouble and that 20 per cent or less give symptoms. His statistics were based upon a study of all cases of ingested foreign body in a general hospital service. It is difficult to say whether they are accurate because, as one reads through the literature, it is now apparent that in no way can the ingestion of a round smooth foreign body be compared to the ingestion of a sharp elongated foreign body and it has become evident from the present study that spontaneous perforations nearly always are caused by objects which have certain characteristics. These objects are usually from one to three inches in length, narrow in at least one diameter and have at least one sharp pointed end. Almost without exception, the patient swallows them without being aware of it. In other words, the history is of little help and therefore it becomes impossible to tell how many of the sharp pointed objects are swallowed and passed without any symptoms developing.

Anatomic factors in the individual patient may determine the likelihood of a penetration of the bowel. Bearse[2] felt that perforation could take place only when there was a stenosis or narrowing; however, this does not seem to be logical as practically none of the sharp object perforations in this series occurred at the pylorus or at the cardiac end of the stomach. They were even rare at the anal sphincters and, conversely, as in the case reported, perforations are reported repeatedly in the wide areas of the cecum and colon.

A review of the sites of perforation gives some clue as to possible important factors. The

outstanding work of McManus[30] has given the best summarized evidence on this point. His statistics show that the stomach and the duodenum[6] rarely are involved. Perforation as high as the midileum[14] is likewise rare. There are twelve cases[3, 10, 42, 44, 38] reported of perforating foreign bodies in a Meckle's diverticulum. There are many reported from the terminal ileum;[33] a large number from the proximal cecum[29, 33, 37, 38, 47, 48] and many through the appendix.[12, 30, 38] If everything beyond the ileocecal valve is considered large bowel, then the number of large bowel perforations by sharp ingested foreign bodies greatly exceeds the number of small bowel perforations as Bearse[2] emphasized.

From the surgical standpoint, however, it seems much more logical to consider the ileocecal area as a single region. This region, including Meckle's diverticulum, accounts for the greatest number of perforations and the syndrome almost universally reported[34] is indistinguishable from appendicitis or appendiceal abscess.

In perforations beyond the hepatic flexure, the principal confusions will be differentiation from diverticulitis (with perforation), obstructing cancer (with perforation) and pelvic peritonitis of undetermined origin.

Certain authors have pointed out the association, in colon perforations, of diverticuli of the colon.[24, 31, 34, 27] The high incidence of the association of foreign body perforation with Meckle's diverticulum, and appendiceal perforation as well as their relationship to sigmoid diverticuli and to incarcerated hernias,[30] seems to indicate that any pouch or sac or contained bulging area in the bowel wall is a definite localizing factor.

There are cases reported, and recently I have seen one in which the symptoms and signs of pelvic peritonitis were present and, at operation, an abscess in the area of the sigmoid colon was found with apparently a spontaneous perforation, in the process of healing but without evidence of foreign body or diverticuli. This brings up the question of the possibility of the perforation of the bowel wall by foreign body with the subsequent spontaneous passage of the foreign body and failure to recognize the true etiologic factor. Bearse[2] felt that this was a likely happening and Aigrot[24] and Brown[50] described suggestive cases. This, of course, is a situation difficult to prove unless the foreign body is recovered later in the stool; however, the possibility of its occurrence seems definite. It may thus be that certain cases of acute perforated sigmoid diverticulitis, so called, are actual foreign body perforation cases with the foreign body not extruding itself into the abdominal cavity but passing ultimately by the normal route.

Bearse[2] feels that most sharp foreign bodies are successfully passed by virtue of the fact that they are enclosed by fecal material which prevents perforation. This seems logical and may explain why so many perforations occur in Meckle's diverticuli in the terminal ileum and in the cecum and appendix areas where the fecal stream is usually liquid and where the foreign body would be, therefore, unprotected.

Fishbones, fowl bones and sharp spicules of animal bone, toothpicks, bristles, splinters and sharp metallic objects, all with the same fundamental characteristics, are the offending objects in the vast majority of cases.

Diagnosis—Preoperative diagnosis of foreign body perforation can rarely be made. Victims seldom remember having ingested the foreign body. X-ray will properly visualize few of the commonly ingested items and may not be diagnostic in other cases. The time element again adds confusion to the diagnosis. Some cases have had symptoms concerning the bowels or abdomen for weeks or months prior to diagnosis. Some have noted a large abdominal mass themselves and, in others,[19, 24] the history has been fulminating. Cases are reported in which the syndrome started within twenty-four hours after the ingestion of the foreign body. Perforations which occur slowly lead to the formation of a mass and their diagnosis involves differentiation of abscess, tumor or localized peritonitis. On the other hand, sudden perforations with spreading massive peritonitis in a few hours have been reported. There is no standard picture.

Differentiation even after entering the abdomen occasionally becomes a definite clinical problem.[15, 27, 30, 31] In the case reported, as in many others reported, the colon will present a hard indurated mass and the first thing that comes to mind is whether there is a stenosing lesion, probably carcinoma, with perforation and an accidentally presenting foreign body or whether the foreign body is the sole cause of the pathologic condition seen. Since no cases of foreign body and perforating cancer together are reported, one may safely say that when a sharp foreign body is found, it may be considered generally as the sole etiologic factor. In connection with the similarity of the perforation syndrome and cancer of the colon, it is interesting to review certain statistics as outlined by Weinberger.[19] In a ten year series of 1,400 autopsies, there were nineteen cases of spontaneous perforation of the large bowel with resultant fatality. Ten of these nineteen were due to perforated diverticuli which had become inflamed. Seven of the nineteen cases of perforation were due to malignancy and only two were mechanical. This emphasizes that mechanical foreign body perforation is rare compared to that due to diverticular inflammation or malignancy unless some of the diverticuli cases are caused by unrecovered foreign body penetration. In a series of 1,500 consecutively reported cases of cancer of the colon at Mayo Clinic there were 144 or 9.4 per cent with spontaneous perforation. In his[19] own series six cases (16 per cent) perforated prior to diagnosis and definitive treatment.

Prognosis—Even if the patient were conscious of swallowing a rigid pointed foreign body, there would be no way to predict what might occur. The

reviewed cases demonstrate that the foreign body may pass to another viscus, may appear through the skin in the area of the navel,[9, 14] groin or scrotum and may possibly pass back and forth from one loop to another. Foreign bodies have been found in the bladder,[28] tube and ovary,[31] perineum,[38] omentum[4] and even in blood vessels.

Treatment—Upon the removal of the foreign body, apparently the opening in the bowel will seal off and establish continuity without any great difficulty. Bearse[2] points out that no attempt should be made to locate the site of an internal perforation as the intestine will close spontaneously. A review of the records shows that this is true for the small bowel perforations and it is possibly entirely true for the large bowel areas. In the case reported here, it was the impression that there was an obstructing colon cancer with perforation and that the chicken bone was merely a portion of the normal dietary matter being extruded through a perforation caused by a tumor. This definitely influenced the therapy instituted.

SUMMARY AND CONCLUSIONS

1. Foreign bodies causing internal perforation have certain characteristics of length, size and shape.

2. Diagnosis of internal foreign body perforation before surgical intervention is rare.

3. The differential diagnosis includes consideration of all of the various perforation-peritonitis syndromes seen in connection with the more common surgical emergencies.

4. Sharp foreign bodies and obstructing perforated cancer are rarely seen together. When a sharp foreign body perforation is found with a tumor mass, the foreign body may be considered the cause of the pathologic condition.

5. Sharp foreign bodies may cause a perforation syndrome but ultimately pass by the normal routes.

6. Foreign body perforation should be considered and searched for in any idiopathic perforation, peritonitis or abscess.

7. The treatment of foreign body perforation of the bowel is essentially conservative, surgical procedure, in most cases, being limited to removal of the foreign body, closure, if possible, of the opening and drainage of the area.

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PRESIDENT'S PAGE

The membership dues of the American Medical Association for 1951 were set as $25.00 by the House of Delegates at the June 1950 Session. At the same time, it was provided that the payment of membership dues will entitle the member to receive the *Journal of the A. M. A. The Journal* was secured in the past by individual subscription or by fellowship in the Scientific Assembly with a charge of $12.00 annually. Beginning January 1951, Fellowship dues will be $5.00. Fellows will be entitled to select one of the specialty journals of the A. M. A. such as the Archives of Opthalmology rather than the *Journal of the A. M. A.* Should more than one publication be desired it is still necessary to subscribe directly.



Bills for membership dues will be mailed early in January. Please do not remit directly to the American Medical Association. Mailing instructions will accompany the dues notice.

Fellowship dues notices are being sent directly from the American Medical Association headquarters.



Editorials

IMPORTANT DATES

It is hoped that as members bring out the 1951 calendar, some dates will be checked right away. Important among these are April 22, 23, 24 and 25, the dates of the 1951 Annual Session of the Association. The meeting will be held at the Municipal Auditorium, Kansas City.

Color television again will add to the scientific session with surgical television programs in the mornings and medical programs in the afternoons. The latter part of the mornings and the afternoons will be taken up with formal lectures. Among special subjects to be presented in the program will be papers on surgery, internal medicine, pediatrics, obstetrics and gynecology, chest surgery, cardiology and hematology. Surgical subjects on color television will include cholecystectomy, herniorrhaphy, pilonidal cyst, perineorrhaphy, hysterectomy, biopsy of the breast, thyroidectomy, hemorrhoidectomy. Medical subjects will include fractures, arthritis, peripheral vascular diseases, cardiac diseases, tumors, dermatology, pediatrics, neurologic examinations, disorders of the back and disorders of the feet. Scientific exhibits will add other subjects to the scientific program.

The session will open with the House of Delegates meeting on Sunday afternoon, April 22. The scientific session will open on Monday morning, April 23 and continue through until the final meeting of the House of Delegates on Wednesday with a break for the adjourned session of the House on Monday afternoon.

AID TO MEDICAL SCHOOLS

Substantiating the belief that the medical profession should take the initiative in raising private financing for hard pressed medical schools rather than seeking federal subsidies for medical education, the American Medical Association appropriated a half million dollars as the nucleus of a fund to be raised for the aid of medical schools throughout the Nation.

The half million dollar contribution was voted unanimously by the A. M. A. Board of Trustees and was announced by its chairman, Dr. Louis H. Bauer, Hempstead, New York, to the House of Delegates at the Cleveland Session.

Dr. Bauer's statement follows: "The Board of Trustees of the American Medical Association is pleased to announce to the House of Delegates that it has appropriated a half million dollars out of its National Education Campaign Fund, which was raised to defend medical freedom, for the aid and support of medical schools which are in need of additional financing.

"This fund will be given to the medical schools for their unrestricted use in their basic training of future physicians.

"This appropriation to aid the medical schools has been made possible by the widespread public cooperation which the profession received from the American people in its campaign against Compulsory Health Insurance. The fight against socialized medicine must go on until this issue has been clearly and finally resolved, but the pressure for regimentation of the medical profession has greatly lessened, due to the magnificent public support which we have received.

"The Board of Trustees, therefore, feels that it is keeping faith with the American people, who have given medicine such a splendid vote of confidence, when it contributes this amount to the medical schools of the Nation.

"There is growing public awareness that federal subsidy has come to be a burden, not a bounty, for it is bringing intolerable increases in taxation, and is dangerously increasing federal controls over our institutions and the lives of our people.

American medicine feels very strongly that it should not seek federal aid for medical schools, until all other means of financing have been exhausted. The Board of Trustees announced yesterday its belief that funds for this purpose could be obtained from private sources—and as practical evidence of our sincerity of purpose, this appropriation has been made as the nucleus of a fund which we hope will be greatly augmented by contributions from many other sources.

"The Board hopes that this action will become a stimulus to other professions, industries, businesses, labor groups and private donors to contribute to this very important cause of protecting and advancing the interests of medical education and the public health.

"The American Medical Association urges all its members to contribute individually to this cause, and we hope that doctors will take the lead in securing contributions from other sources.

"Furthermore, the American Medical Association invites attention to the fact that it has been spending about a quarter million dollars a year for many years past to advance medical education through its Council on Medical Education and Hospitals and other departments. This appropriation, voted today, for an entirely new purpose, is in addition to nearly $285,000 already budgeted for this work during 1951.

"The Nation's medical schools are of the greatest importance to every American citizen and the A. M. A. has had the advancement of their standards as one of its main objectives for over 100 years. The Board of Trustees feels that if all other organizations and individuals will render support of this worthy cause in accordance with their financial ability that not only will the financial security of the medical schools be assured, but that their freedom will be protected."

Organization and Economics

NEWS NOTES

Alfred Goldman, M.D., St. Louis, will speak at a postgraduate course in diseases of the chest sponsored by the Southern Chapter of the American College of Chest Physicians in cooperation with Vanderbilt University School of Medicine. The conference will be held in Nashville, Tennessee, January 22 to 27. Dr. Goldman's subject will be "Pleurisy With Effusion."

Richard E. Johnson, M.D., Columbia, Eugene M. Bricker, M.D., and Edwin C. Ernst, M.D., St. Louis, were speakers at a meeting of the consulting staff of the Ellis Fischel State Cancer Hospital on December 3. Dr. Johnson spoke on "Effect of Treatment in Carcinoma of the Breast," Dr. Bricker on "Bladder Substitution Following Pelvic Evisceration," and Dr. Ernst on "Evaluation of the Various Methods and New Concepts in the Treatment of Carcinoma of the Cervix."

The American Public Health Association has conducted a survey of the activities of the Division of Health of Missouri. Representatives of the Missouri Health Council will publish a report on the review made of the division.

Norman Tobias, M.D., St. Louis, will address the General Practitioners Study Club of Greater St. Louis on January 17. His subject will be "Office Treatment of the Common Skin Diseases."

MUSINGS OF THE FIELD SECRETARY

The American Medical Association held its third annual medical public relations conference in Cleveland on December 3 and 4. Some 350 registrants heard a program revealing a number of successful PR activities being carried on in various local and state medical societies. Two areas of medical PR coming in for considerable discussion were (1) fees and (2) availability of medical services.

Committees have been established in numerous medical societies to attempt to eliminate misunderstandings between patients and physicians. These committees receive complaints from patients concerning medical services and after thorough investigation of the cases they try to bring about satisfactory understanding between the parties involved.

Many local societies have established medical service bureaus to provide immediate medical care: (1) if patients are unable to reach their own doctors, (2) to help newcomers to the community get acquainted with a doctor they like, and (3) to see that the services of a physician or surgeon are available to all who need them at all times regardless of ability to pay.

Efforts of medical societies to develop better relationships with the press and radio are proving fruitful in many places. Meetings between representatives of the press and the medical society, and between those of the radio stations and the medical society have furnished opportunity for better mutual understandings.

It was suggested by one speaker that politics and PR are closely akin but not synonomous.

One suggestion offered for gaining increased participation of physicians in local civic and group health activities is to have the local medical society appoint doctors who will actually take part in these functions to represent the society.

Carl F. Vohs, M.D., St. Louis, President, Missouri Medical Service, appeared on the program and presented a well received paper entitled "Promoting Voluntary Health Insurance." He suggested among other things that individual doctors need to know more about the voluntary health insurance plans and contracts which they are promoting.

INFANTILE PARALYSIS MEETING

The Missouri Chapter of the National Foundation for Infantile Paralysis held a meeting in Kansas City on December 13 at which Mr. Basil O'Connor, New York, president of the foundation, spoke. He spoke on "Epidemics and Economics" giving statistics on the incidence of poliomyelitis saying that 1950 was the second highest in history. He also gave information on the finances of the foundation and told of the way money of the foundation is spent in combatting the disease.

SOCIAL SECURITY LAW—1951

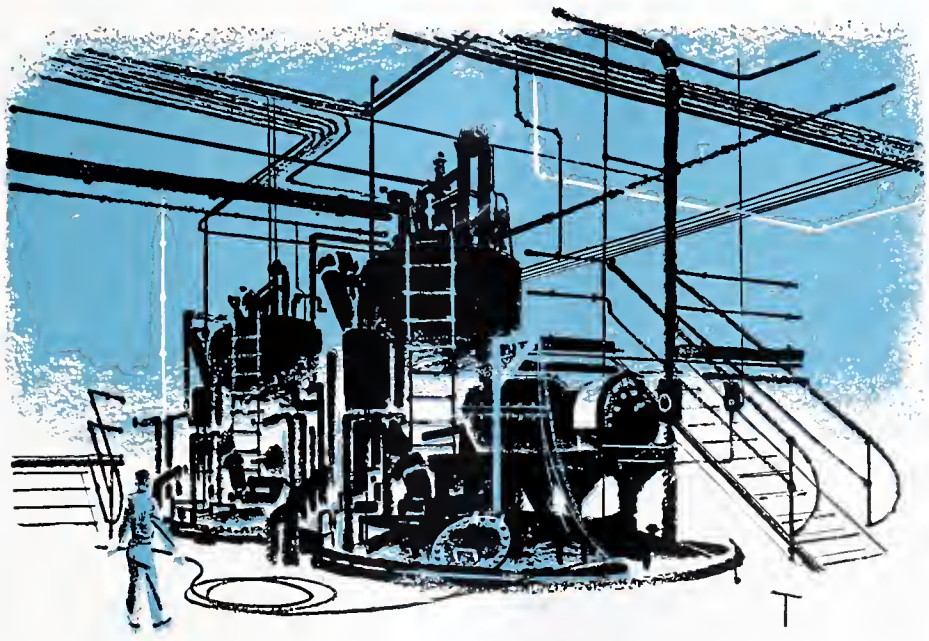
Changes in the Social Security Act approved by the Congress of the United States during 1950 take effect January 1, 1951. At present the physician employer deducts 1 per cent of his employee's wages on the first $3,000.00 earned. He then matches that with a like amount and at the end of each quarter sends a report to the Collector of Internal Revenue together with a check for the total of the amount deducted plus his contribution. Beginning January 1, 1951, the physician is required to deduct 1½ per cent of the employee's wages on the first $4,800.00 of wages earned, contribute a like amount and send to the Collector of Internal Revenue as before.

Also, if a maid, laundress, cook, chauffeur or other domestic help works a minimum of twenty-four days in a calendar quarter and receives $50.00 or more in wages, that person is now included under the Social Security Act. This is on the same basis of 1½ per cent withheld from wages and matched by the employer. If a person works in the home who is eligible and the

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Aureomycin is now available in a number of convenient forms, for use by mouth and in the eye. New forms of this antibiotic of unsurpassed versatility are constantly being brought out.

Capsules: *Bottles of 25 and 100, 50 mg. each capsule. Bottles of 16 and 100, 250 mg. each capsule.*
Ophthalmic: *Vials of 25 mg. with dropper; solution prepared by adding 5 cc. of distilled water.*

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CARDIOVASCULAR DISEASES

Almost immediately following his appointment as Director of Health of Missouri, early in 1950, Buford G. Hamilton, M.D., made a study of the various U. S. Public Health Service grants going into his department. One of these grants, for the purpose of heart disease control in Missouri, was not expended during 1949.

Dr. Hamilton completed arrangements with the St. Louis University School of Medicine for a series of seminars to be conducted in various parts of Missouri to inform physicians of some of the cardiac problems which may be encountered in practice. The program was financed equally by the University and a U. S. Public Health Service grant.

The meetings were arranged by the Association and took place in seven of the ten Councilor Districts during the last three months.

In addition the University, through its section on Cardiovascular Disease, has scheduled a series of clinics on heart disease problems. All members of the Association are invited to attend the clinics which are held regularly at Firmin Desloge Hospital, St. Louis. For further information regarding the clinics, contact E. Lee Shrader, M.D., or James G. Janney, M.D., Firmin Desloge Hospital, St. Louis.

SOCIALIZED MEDICINE IS NO BARGAIN

WILLIAM L. HUTCHESON
INDIANAPOLIS, IND.

I am against socialized medicine. So is the organization which I have the honor of heading. At the Twenty-sixth General Convention of the United Brotherhood of Carpenters and Joiners of America, held in Cincinnati last September 1, 300 delegates, representing better than 54 per cent of the total membership, voted down a resolution to support the National Health Program. This probably does not jibe with the feelings of a good deal of the rest of the labor movement because much of the pressure for "free" medical care is coming from labor organizations. But it does reflect my sentiments and the sentiments of our recent convention.

Saving a dollar has never been distasteful to me. In fact I like to get as much for my money as the next man. That is one of the reasons why I oppose socialized medicine. It is no bargain. It looks cheap the way the backers present it, but when you dig down under the fancy layer of propaganda frosting you find that it can be mighty expensive. The British people have already discovered this fact. The July issue of International Labour Office contains some interesting data on the operation of the National Health Service in Britain. I quote a few lines of that report:

"The total (gross) cost of the National Health Service in 1948-1949, the first year of operation, greatly exceeded the original estimate. This was 265 million pounds, as against a revised estimate of 368 million pounds, with a net cost to the taxpayer of 278 million pounds. The revised estimate for the year 1949-1950 was 450 million pounds as against an original estimate of 352 million pounds. For 1950-1951, the cost is estimated at 484 million pounds; in 1946 when the bill was passed, the service was believed to cost 167 million pounds a year."

In case you do not understand what the International Labour Office is, I can best explain its functions by quoting a bit from its preamble:

"The International Labour office is an association of nations, financed by Governments and democratically controlled by representatives of Governments, of management and of Labour organizations.

"Its purpose is to promote social justice in all countries of the world. To this end it collects facts about labour and social conditions, formulates minimum international standards, and supervises their national application."

The I.L.O.'s publication, "International Labour Review," is published in the United Kingdom. As an international organization, I.L.O.'s findings are supposed to be strictly impartial.

Getting back to the report; if I read it correctly, service that was supposed to cost 167 million pounds per year when the plan was set up in 1946 costs 484 million pounds per year, and the end is not yet in sight. By my old fashioned kind of arithmetic that is an increase of better than 345 per cent and I am sure my poor old mother, who always made a dime do the work of a quarter, would not consider that kind of proposition any bargain.

I know! I know! The socialists claim that money is of no consequence in the matter of national health; getting the poor the same quality and quantity of medical care as the rich can get under private enterprise is the advertised objective of the National Health Program. That sounds fine, too; but on page 57 of the I.L.O. report, I find the following sentences:

"Survey of the distribution of doctors by boroughs shows that certain wealthier districts (of London) have an average of one doctor for 1,261 patients, while in the inner East End there are 2,472, or twice as many patients, per doctor. For a group of southern boroughs, the average is 2,897."

If that is not the "one horse and one rabbit" recipe transferred from the meat pie maker's kitchen to the National Health Program, then I need new reading glasses. I have tried to figure it from all angles but the answer I always come up with is that the lumbago, shingles and bellyaches of London's South Siders get only half the attention that similar ailments get in the swankier districts. For all the planning that has been done, there is still an uneven distribution of doctors in London. If the backers of the National Health Program are to achieve their objective of equal health protection for all, the next step must be to tell doctors when and where and how they are to practice. Therein lies my greatest fear of socialization.

Socialization and death have one thing in common; you cannot be either a little bit socialized or a little bit dead. It is whole hog or nothing. After two years of the National Health Program, London doctors still have preferences as to where they want to practice. By compulsion of one kind or another, somebody is

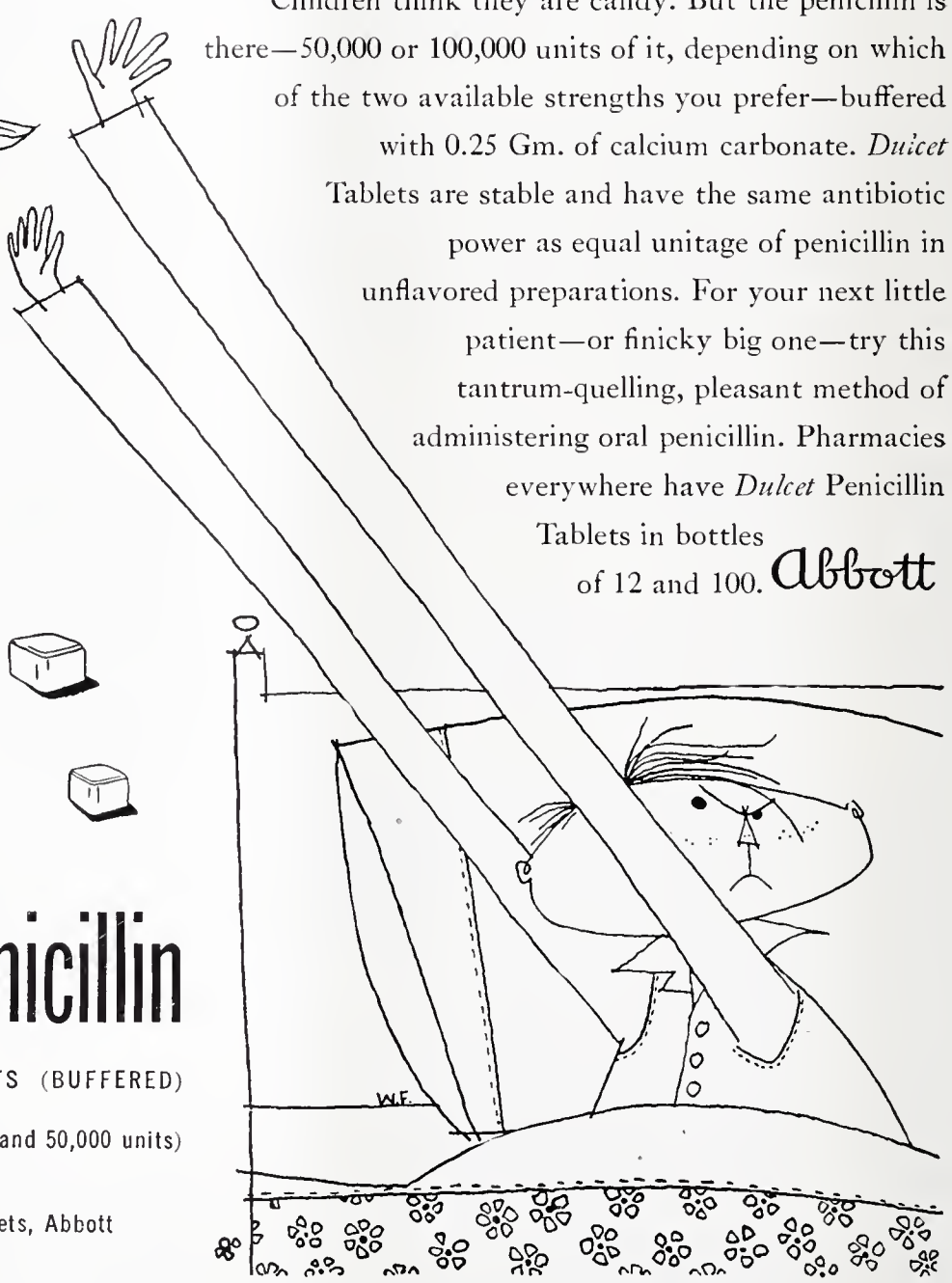
General President, United Brotherhood of Carpenters & Joiners of America and Vice President, American Federation of Labor.

Presented at a joint session of the American Medical Association House of Delegates and Third Annual Conference of the National Educational Campaign, Cleveland, December 7, 1950.

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going to have to shoo doctors away from the fancy neighborhoods into the tenement districts or the program will wind up where it started. When the government is given authority to tell one group or one profession where and how its members are to work, no other group or profession can be safe for long.

If the day ever comes to America when Uncle Sam usurps the power to dictate to doctors under a health plan, it will be a sad day for carpenters. Adequate housing is still an unsolved problem in this country, especially for the poor. If it is logical to nationalize the medical profession to get more medical service for the poor, it is equally logical to nationalize the home construction industry to get roofs over the heads of the lower income groups.

I do not know much about doctors, but I know quite a bit about carpenters. They are an independent lot. They want to work where and how they please. The first bureaucrat who told a carpenter he had to work in Little Rock when he wanted to work in Lancaster would be gumming his food for lack of teeth. Carpenters want to be free agents; free to work where they want to; free to negotiate the terms of their wages and working conditions through collective bargaining; yes, even free to leave the industry and try their luck at something else if the spirit moves them.

They will retain these freedoms only so long as all other groups retain theirs. Socialization is like a wolf with a tapeworm; once it starts gnawing, it never can stop. Socialized medicine would only be the first bite out of our free enterprise system; it would not be many years before the carpenters would be feeling the teeth of socialization on the seats of their overalls. Any way you look at it, socialized medicine is no bargain and the carpenters want none of it.

I know that the backers of the national health plan in this country resent the term "socialized medicine." They have all sorts of arguments to "prove" that doctors and patients will remain free as the air under their program. They make a strong case. Perhaps if human nature were less ornery and less avaricious, an idealistic health program might work out all right. But so long as people have preferences, so long as Park Avenue has more appeal than Hell's Kitchen, there will be an uneven distribution of doctors under any plan that does not contain compulsion. And once compulsion enters the picture, the rights and freedoms of all citizens stand in jeopardy. To me, it is as simple as that. For forty years, I have fought communism tooth and toenail because I do not want anyone pushing me around. I certainly do not want to put my head into a socialization noose voluntarily when the results can be as undesirable as communism.

I have always respected the medical profession for the fine contribution American medicine has made to human welfare. As I watched your battle against regimentation during the past two years, I have added to that respect. The physicians of this country have shown that they are willing to fight for their conviction. I salute you today not only as doctors but as crusading citizens as well. We in the labor movement have our own cross of regimentation to bear. The fight you are making is part of the same war. It is a war against concentration of authority in a few hands in Washington. As a veteran of forty years in the labor movement, I know what it is to fight for human rights. I am happy to take my stand beside you.

SOCIETY PROCEEDINGS

FOURTH COUNCILOR DISTRICT

OTTO W. KOCH, CLAYTON, COUNCILOR

On Thursday night, December 7, twenty-six physicians braved the wintry weather to attend a dinner meeting of the Fourth Councilor District at the Southern Air, Wentzville.

Following an enjoyable social hour and dinner, three well presented talks were given by members of the Cardiovascular Section of St. Louis University School of Medicine, as follows:

"Arteriosclerosis Obliterans," R. Emmet Kelly, M.D., St. Louis.

"Angina Pectoris," James B. Stubbs, M.D., St. Louis.

"The Diagnosis and Management of Coronary insufficiency," D. B. Flavan, M.D., St. Louis.

OTTO W. KOCH, M.D., Councilor.

Jefferson County Medical Society

On October 20 at 7:00 p.m., the Jefferson County Medical Society and the Woman's Auxiliary held a joint dinner meeting at Quonset Inn, Crystal City.

Following the dinner and social hour, Attorney Norris H. Allen, St. Louis, gave a talk on "The Doctor and the Law." He was introduced by Mr. A. W. Breckenkamp of the Medical Protective Company who had arranged the program for the meeting.

Those present were Drs. and Mrs. O. J. Sum, Barnhart; R. H. Donnell, V. E. Schulein and J. F. Rutledge, Crystal City; Thomas A. Donnell, C. E. Fallet and Karl V. McKinstry, DeSoto; Bart Bolgar, Festus; John B. Frerichs, Valley Park; Drs. Harold Donnell, DeSoto; Harry Yoskit, Festus, and Thomas Dobbins, Hillsboro.

JOHN F. RUTLEDGE, M.D., Secretary.

St. Louis County Medical Society

The St. Louis County Medical Society held its regular meeting on October 11 at 8:45 p.m. in the Health Center Auditorium, St. Louis County Hospital.

Dr. Lois Wyatt, chairman of the entertainment committee, reported on the annual picnic held September 17 and announced that a reservation had been made at the Sheraton Hotel for the installation of officers on January 10, 1951. Dr. Wyatt was given a vote of thanks for her work.

Dr. Martyn Schattyn announced that the constitution and by-laws committee proposed a student membership for the Society with dues of $2.00 a year. After discussion, it was voted to refer the matter back to the committee for further study.

A communication from Mr. C. P. Loranz, Southern Medical Association, was read announcing the meeting in St. Louis November 13 to 16.

A communication from Mrs. Frederick B. Eiseman, chairman of the nursing advisory committee of the St. Louis County Health Department advisory board, was read announcing a television presentation demonstrating a typical well baby clinic on October 31 at 11:00 a.m.

Dr. C. P. Dyer moved that the Society approve an advertisement to appear in St. Louis papers in connection with the A. M. A. educational campaign advertisement on October 11. The motion passed.

Upon motion of Dr. F. W. Tieber, the Society approved appropriating $50.00 each year for a gift for the outgoing president.

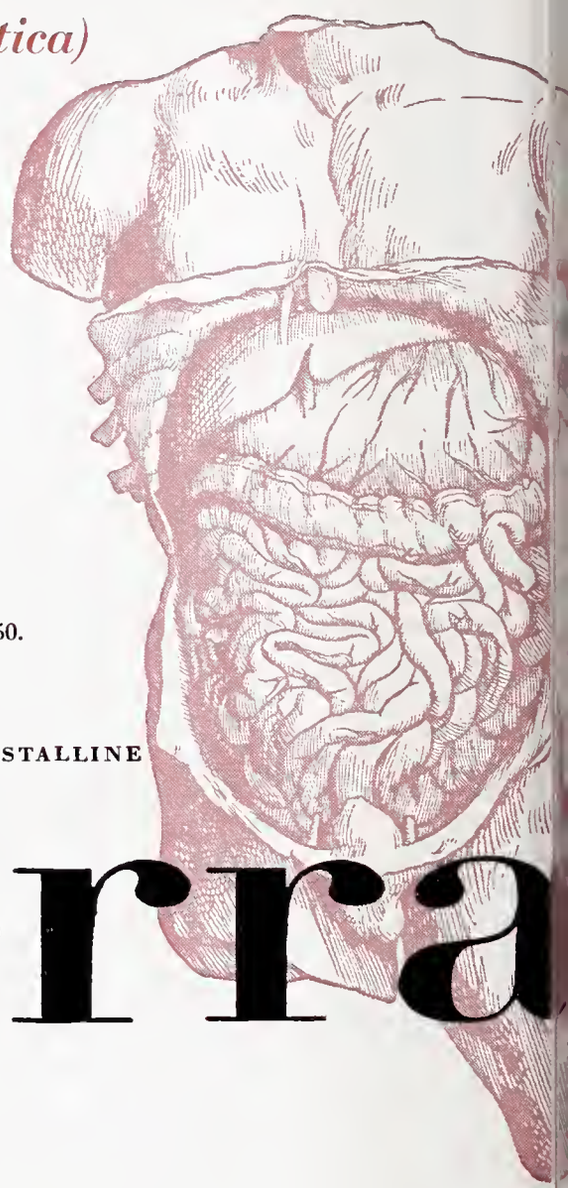
G. Lynn Krause, M.D., St. Louis, spoke on "Diagnosis

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Most, H., and Van Assendelft, F.:
Ann. New York Acad. Sc. *53*:427 (Sept. 15) 1950.



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Dowling, H. F.; Lepper, M. H.; Caldwell, E. R., and Spies, H. W.: Ann. New York Acad. Sc. *63*:433 (Sept. 15) 1950.

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and Treatment of Common Rectal Disorders," emphasizing the importance of the history in diagnosis and giving his treatment.

Dr. S. Tashma introduced two applicants for membership, Drs. David E. Smith and James W. Fletis.

Louis F. Howe, M.D., Secretary

FIFTH COUNCILOR DISTRICT

J. F. JOLLEY, MEXICO, COUNCILOR

Fifty-five physicians attended the meeting of the Fifth Councilor District at the Daniel Boone Hotel, Columbia, on the afternoon and evening of November 1.

The afternoon scientific session included "Hypertensive Heart Disease" presented by the Cardiovascular Section of the St. Louis University School of Medicine as follows:

"Essential Hypertension," E. P. Reh, M.D., St. Louis.

"Hypertensive Heart Disease," C. G. Vournas, M.D., St. Louis.

"Treatment of Hypertension," Max S. Franklin, M.D., St. Louis.

A social hour and dinner touched off the evening program at which W. A. Bloom, M.D., Fayette, President of the Association, spoke on "Medicine in Action." Mr. T. R. O'Brien, Executive Secretary, discussed a few current problems facing the profession.

Carroll P. Hungate, M.D., USNR, Kansas City, discussed "Atomic Warfare and the General Practitioner."

J. F. Jolley, M.D., Councilor.

SIXTH COUNCILOR DISTRICT

R. W. KENNEDY, MARSHALL, COUNCILOR

Thirty-five physicians attended an afternoon and evening meeting of the Sixth Councilor District at the Bothwell Hotel, Sedalia, on November 30.

The scientific session in the afternoon was presented by the Cardiovascular Section of the St. Louis University School of Medicine as follows: "Pathogenesis of Congestive Heart Disease," Charles J. Kromer, M.D.; "Physical Findings and Differential Diagnosis of Congestive Heart Failure," and "Treatment of Congestive Heart Failure," James P. Murphy, M.D.

The Pettis County Medical Society served as host at a pleasant social hour between afternoon and evening sessions. A steak dinner touched off the evening program followed by pertinent discussions on medical society problems.

W. A. Bloom, M.D., Fayette, President, spoke on "Medicine in Action."

Captain Carroll P. Hungate, M.D., USNR, Kansas City, spoke on "Atomic Warfare and the General Practitioner."

Mr. T. R. O'Brien, Executive Secretary, discussed a number of current organizational activities.

R. W. Kennedy, M.D., Councilor.

EIGHTH COUNCILOR DISTRICT

W. S. SEWELL, SPRINGFIELD, COUNCILOR

Ozarks Medical Society

The Ozarks Medical Society met at the Missouri State Sanatorium, Mount Vernon, on November 14. The scientific program followed a turkey dinner.

Everett D. Sugarbaker, M.D., Jefferson City, spoke on "Tumors of the Oral Cavity," illustrating his paper with slides and colored photographs.

Kenneth Glover, M.D., Secretary.

NINTH COUNCILOR DISTRICT

E. C. BOHRER, WEST PLAINS, COUNCILOR

South Central Counties Medical Society

On the afternoon and evening of November 2, a meeting of the Ninth Councilor District was held at Lebanon with forty-five physicians in attendance. A number of wives of the physicians attended the evening session.

The afternoon scientific session was presented by the Cardiovascular Section of the School of Medicine of St. Louis University as follows:

"Pathologic Anatomy of Congenital Heart Disease," Vincent Moragues, M.D., St. Louis.

"Inoperable Congenital Heart Disease," James G. Janney, M.D., St. Louis.

"Operable Congenital Heart Lesions," C. P. Lynxwiler, M.D., St. Louis.

"Surgical Aspects of Congenital Heart Disease," Sidney Smith, M.D., St. Louis.

An enjoyable social hour and dinner preceded the evening session at which W. A. Bloom, M.D., Fayette, President of the Association, spoke on "Medicine in Action." Mr. T. R. O'Brien, Executive Secretary, discussed important Association business.

G. E. Thoma, M.D., St. Louis, Department of Internal Medicine, St. Louis University School of Medicine, spoke on "Atomic Warfare and the General Practitioner."

E. C. Bohrer, M.D., Councilor.

The South Central Counties Medical Society met for dinner at the El Patio Hotel, Cabool, on November 15, with the following members and visitors present: Drs. R. W. Denney, H. G. Frame, S. W. Connor and A. C. Ames, Mountain Grove; Garrett Hogg, Jr., Cabool; F. J. Burns and S. G. Kramer, Houston; M. B. Perkins, Willow Springs; E. C. Bohrer, Rollin H. Smith and C. F. Callihan, West Plains; C. W. Cooper, Thayer; A. R. Walker, Mammouth Spring, Arkansas; D. L. Yancey and Harry Silsby, Springfield. The wives of most of the physicians also attended the meeting.

Following dinner, the meeting was called to order in the office of Dr. Hogg by the president, Dr. Smith.

The minutes of the last meeting were read and approved.

James R. Mott, M.D., Hartville, was made an honor member.

Dr. Silsby gave a case report of a woman with a malignant condition of the liver.

Dr. Yancey gave an interesting talk outlining the treatment of the most common fractures.

A vote of thanks was given both speakers.

The meeting adjourned to meet in West Plains on December 20.

A. C. Ames, M.D., Secretary.

TENTH COUNCILOR DISTRICT

FRANK W. HALL, CAPE GIRARDEAU, COUNCILOR

Mineral Area County Medical Society

A joint meeting of the Mineral Area County Medical Society and the Woman's Auxiliary was held at 8:00 p.m. at State Hospital No. 4, Farmington, on November 30.

Robert Lange, M.D., St. Louis, of the American Red Cross Center in St. Louis, spoke on "The Red Cross Blood Program."

Norman Knowlton, M.D., St. Louis, presented the subject "The Medical Aspects of Atomic Warfare."

Both subjects were interesting and informative.

Paul L. Jones, M.D., Secretary

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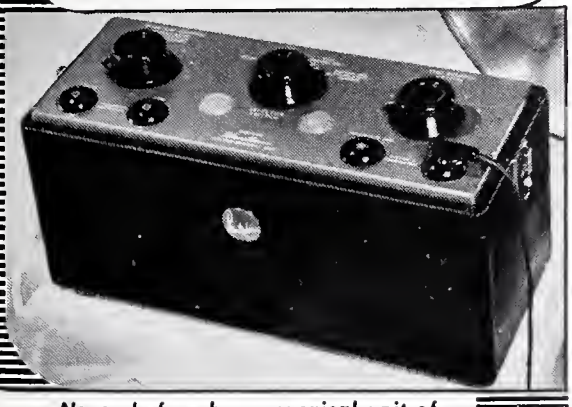
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From where I sit *by* Joe Marsh

Sometimes Good Intentions Aren't Enough

That fire at the Hastings' place last night didn't do much damage, but Volunteer Chief Murphy was pretty angry about it. Spoke to some of us over dinner and a bottle of beer.

"Hastings' farm is a good mile from town," he said. "And by the time we'd dodged all the people on the highway who were going to watch, we hadn't a minute to waste.

"Then blamed if those sightseers hadn't parked cars right in Hastings' driveway and there was a mob around the house—just gawking. Joe, tell folks a fire's no sideshow. Ask 'em to think of the other fellow!"

From where I sit, sometimes even good intentions turn out to be unfair interference. Whether it's blocking the right-of-way of fire equipment, denying a man a chance to practice medicine where and when he chooses, or criticizing a person's right to enjoy a temperate glass of beer—the American Way is to give *everybody* his rightful "share of the road"!

Joe Marsh

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Sterility Tests
Speech Without Larynx
Proper Application of Casts and Splints in Fractures
Local Anesthesia
Fluid and Electrolytic Balance in Surgery
Use and Misuse of Obstetrical Forceps
Common Problems in X-raying Interpretations
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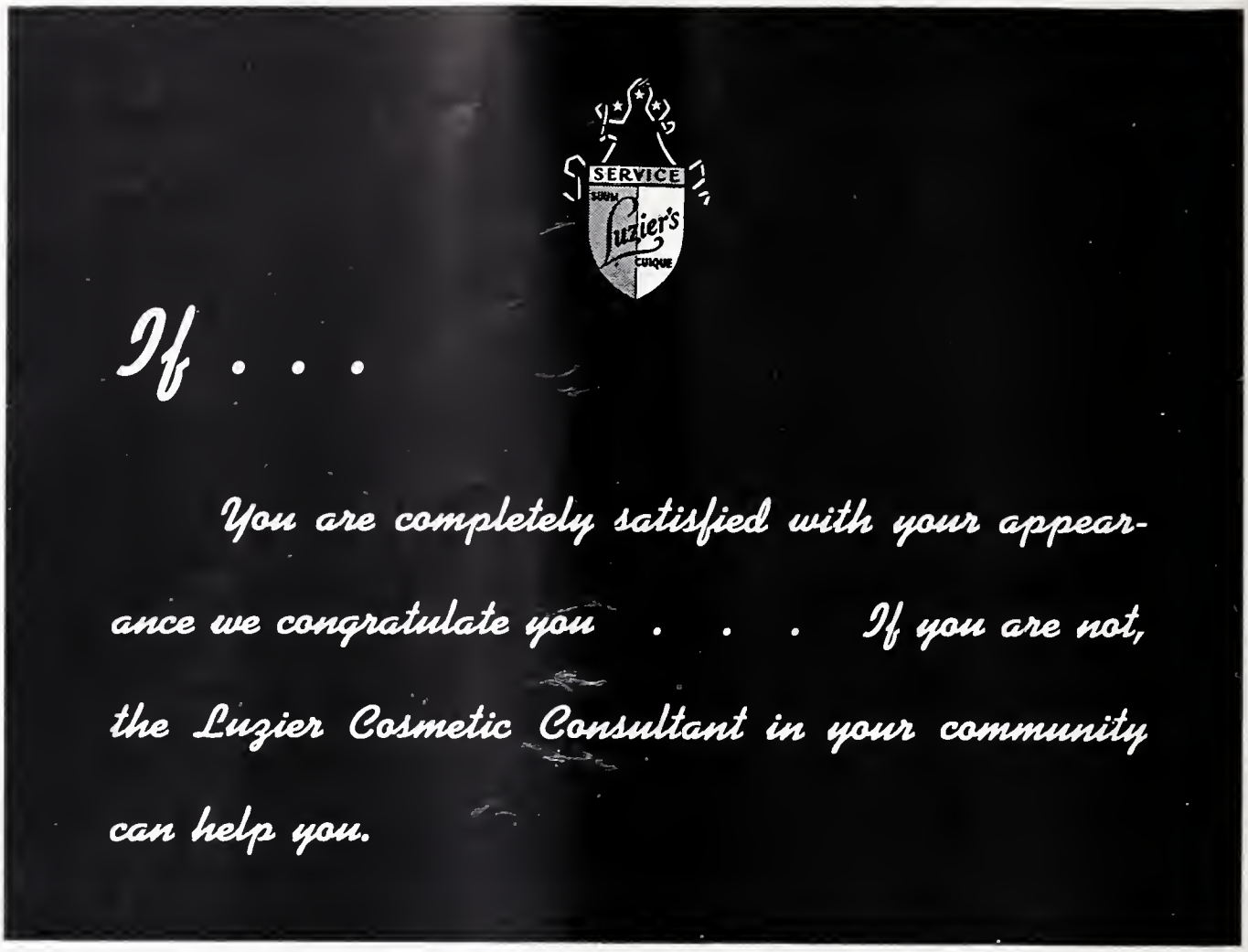


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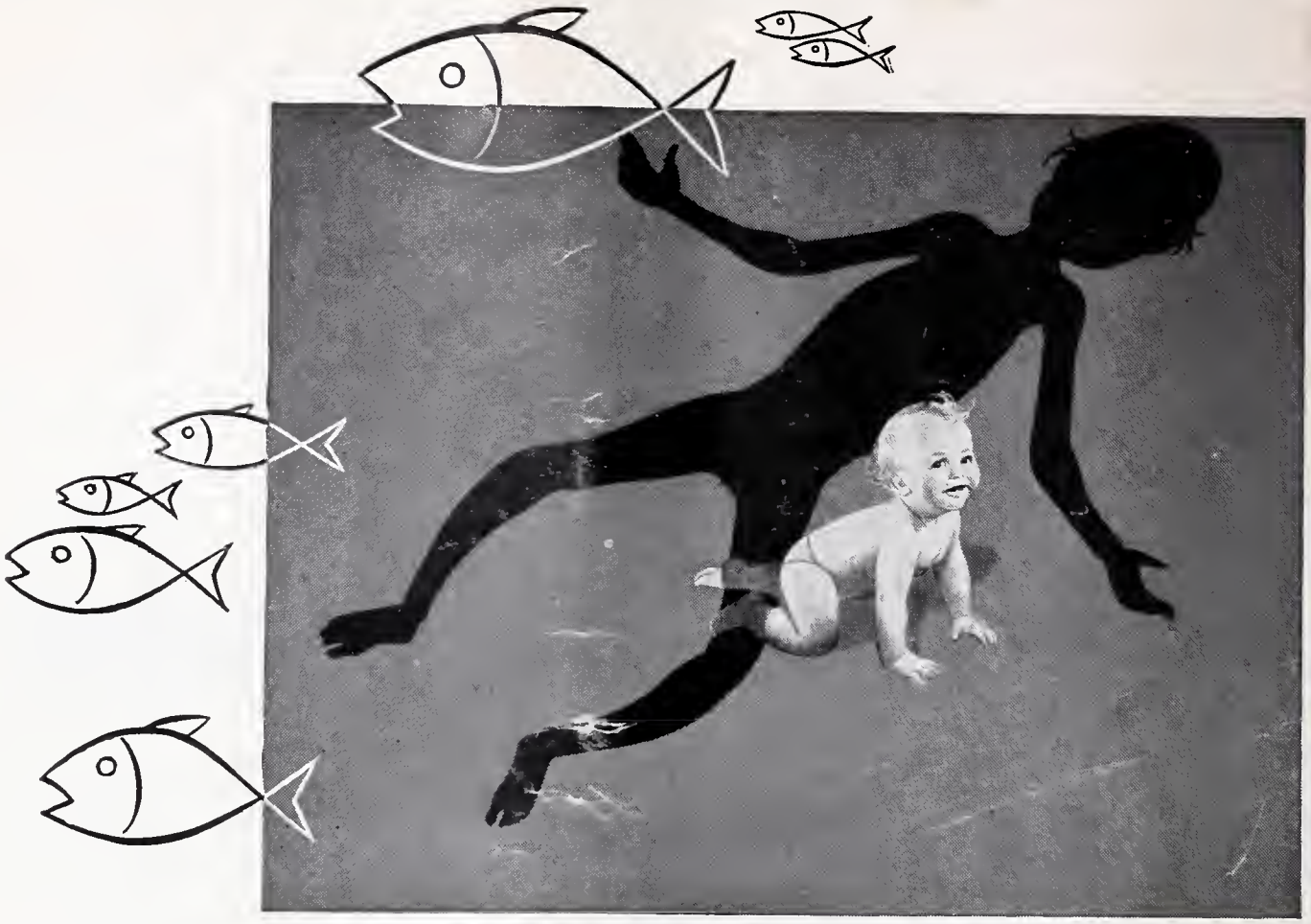
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(2) McLester, J. S.: Nutrition and Diet in Health and Disease, 5th ed., Phil., W. B. Saunders Company, 1949, page 364.

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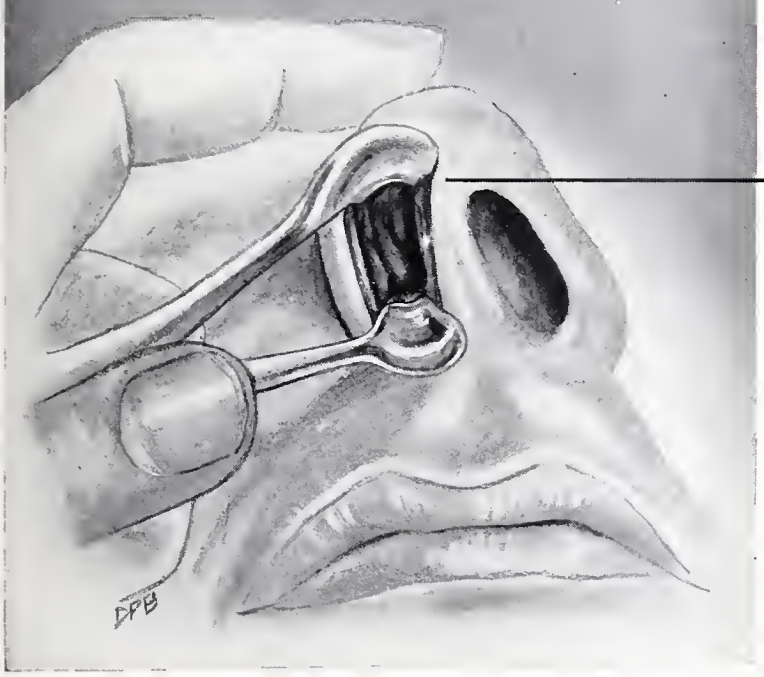
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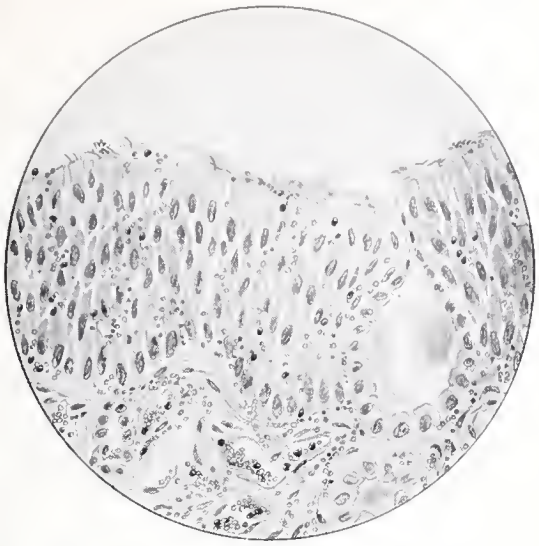
*Based on average reported values for milk.

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Callaway	5	R. B. Price	Fulton	R. N. Crews	Fulton
Camden	5	E. G. Claiborne	Camdenton	G. T. Myers	Macks Creek
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Carroll	1	J. Morris Atwood	Carrollton	John H. Platz	Carrollton
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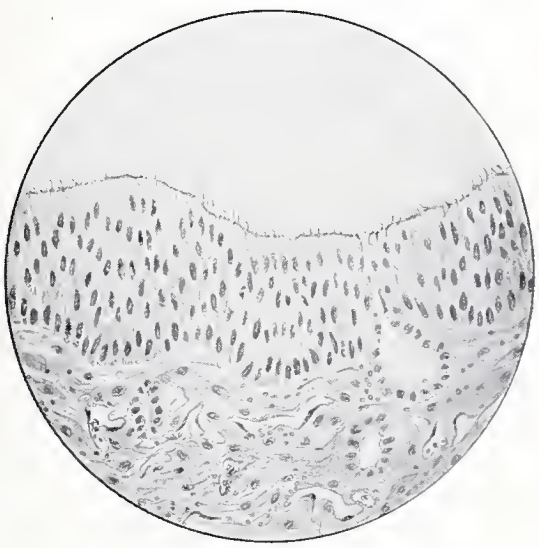
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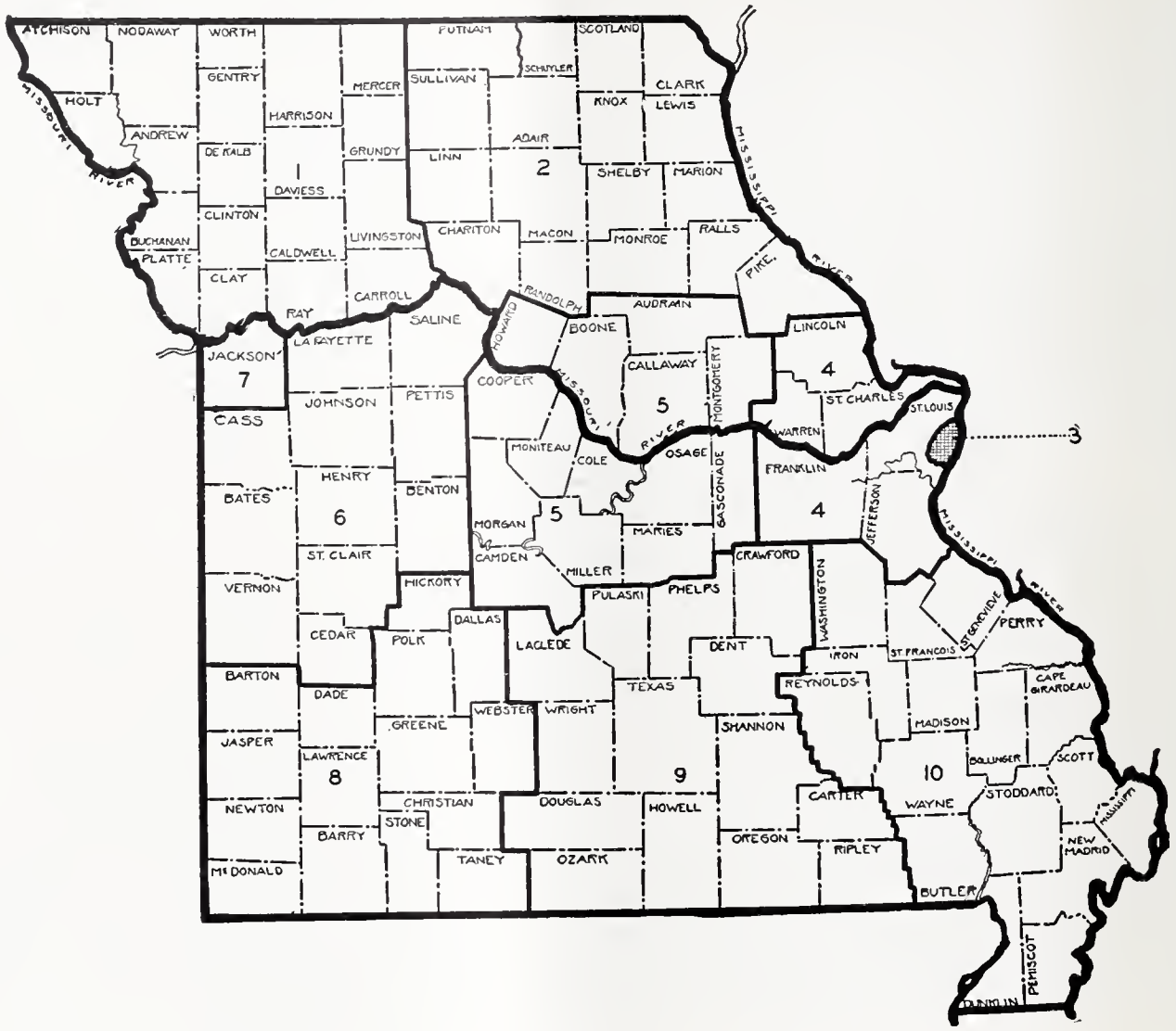
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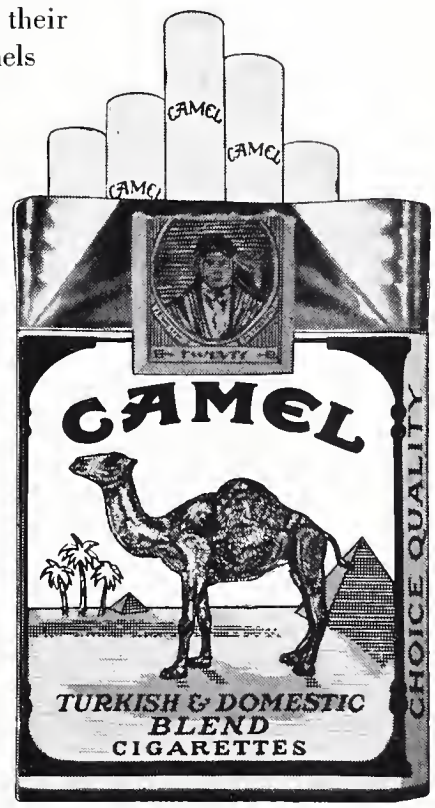
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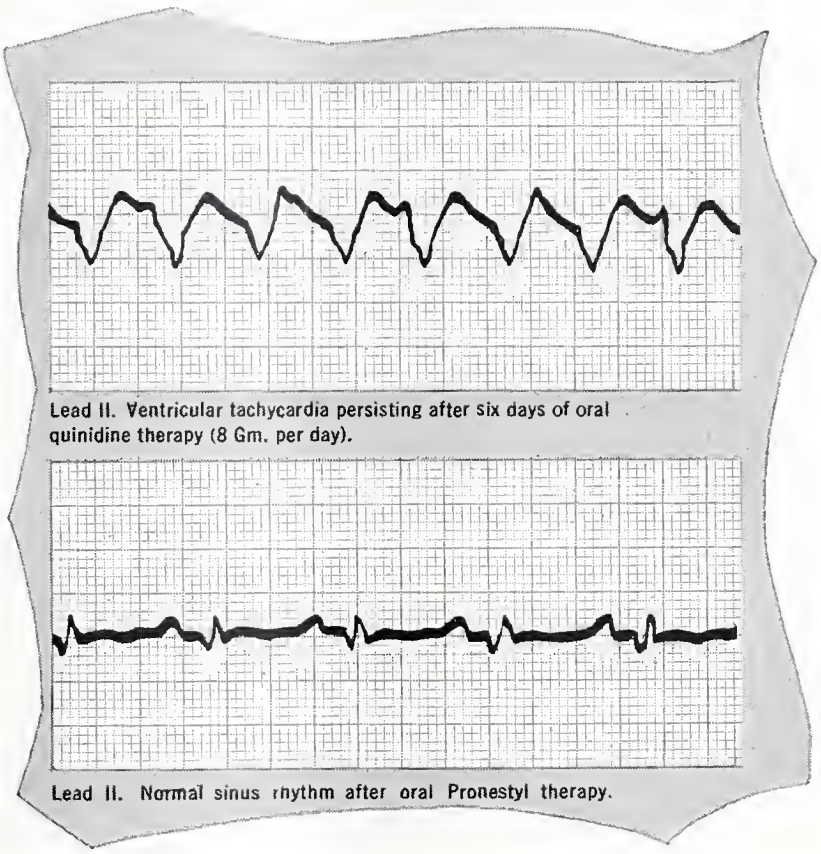
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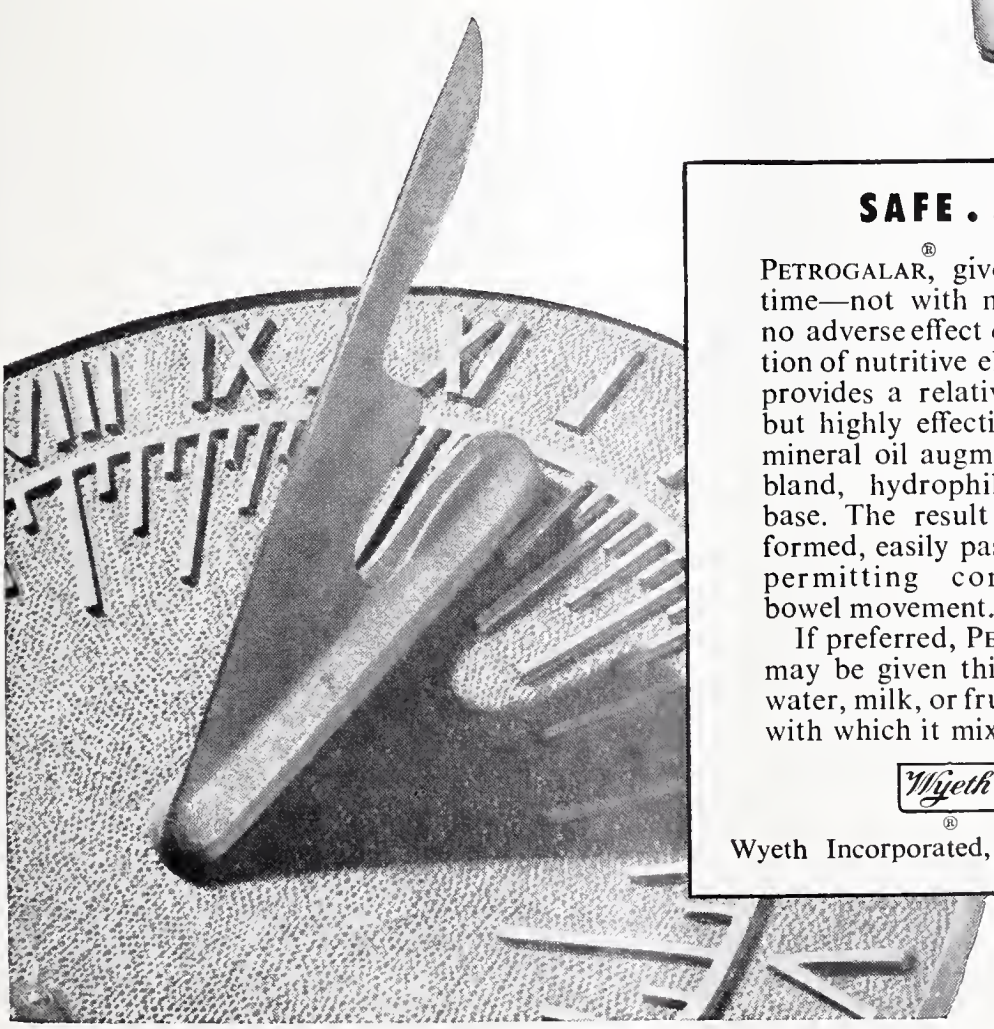
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Volume 48 February, 1951 Number 2

Scientific Articles

EARLY DIAGNOSIS OF CANCER THE BIOPSY

EDWARD J. JORDAN, M.D.
ST. LOUIS
and
E. LAWRENCE KEYES, M.D.
ST. LOUIS

While scientists and research workers are endeavoring to establish an accurate test to show cancer in the earliest stages, it is well to concentrate on the methods now available and use them intelligently. The one sure method of proving a clinical diagnosis of cancer is the study of tissue sections in one form or another. The biopsy offers the only convincing proof as to whether a given lesion is malignant or not at the present time. Most of the tests made now are compared to the actual biopsy to show their accuracy. Taking a biopsy does not necessarily mean that one is going to inflict surgical procedures upon the patient. A biopsy specimen is taken and studied every time a blood smear is stained and studied, or a cervical smear, or a paraffin section of centrifuged gastric contents. It is not always necessary to "operate" in order to get a tissue specimen for study, although for a long time the word "biopsy" has meant just that to some physicians. The student, house officer or technician does a biopsy every time they do a blood count on a patient, or a gastric analysis. They are studying the effect of disease on the various fluids or organs of the body; they are getting a living picture, one might say, a biopsy, of what is going on in an individual patient. All should realize what a biopsy can mean in arriving at a diagnosis which can be backed up by facts and tissue proof of the facts.

At the autopsy table, the student sees the end process of the disease, covered over at times by many complications and errors in the treatment. He does not get a true picture of the disease but finds that here is a disease process which will bring death to the patient. His picture of the disease process is somewhat confused by what he sees in the autopsy room. The study of the biopsy, on the other hand, early in a disease, gives him a look at the process practically uncomplicated. Nothing is more impressed on his mind than the complaints of the patient, the history and the physical examination, the gross pathology and tissue proof that the signs and symptoms and findings which he put down in his history are confirmed by actual tissue proof of the disease. It is, indeed, satisfying to the student to know that there is a straight forward logical method of diagnosis.

It is well to remark here that, although there are some dangers in the actual procedure of biopsy, it is a serious offense against good thinking and good treatment to suggest radical treatment without positive tissue proof of a disease. Even the specialist who prides himself on recognizing a disease by the clinical appearances of gross lesions, particularly cancer, has no right to judge a case on the merits of gross and clinical examination alone. Likewise, giving a patient or his family a hopeless prognosis without histologic proof is akin to stupidity.

Naturally, there are dangers in taking a biopsy just as in any other procedure one does on a patient. The indications for biopsy may be summed up as any manifestation one sees in a patient which arouses suspicions of malignancy.

The examiner must be suspicious. He should have a good working knowledge of the common places or areas in which early carcinoma is usually found. He should be suspicious of any gross lesion no matter where he finds it. He must insist on patient cooperation in regard to repeated and often boring examinations. It is only by seeking that one finds things and only by repeated complete physical examinations will the early uncomplicated case of malignancy be picked up.

The individual who does the biopsy should be capable of taking care of any complications which may arise from the procedure. Hemorrhage, infection and spread of the disease are probably the

From the Department of Surgery, St. Louis University School of Medicine, St. Louis.
Aided by training grant CT 619 from the National Cancer Institute of the U. S. P. H. S., and by a grant from the Missouri State Division of the American Cancer Society.

most usual complications. The latter is an important complication which frequently is overlooked, that is, the danger of spreading tumor cells during the actual biopsy. This may be avoided especially in the skin, by excising the whole lesion and a comfortable margin of good skin too. In all types of lesions, the instruments used in taking a biopsy should be used once. The dangers of transferring cancer cells to fresh tissue probably will be avoided by this simple procedure.

Some men likewise question the use of local anesthesia for a biopsy. They believe that the irritation caused by the needle and the spreading of the tissues by the anesthetizing solution may open up new pathways to the spread of the tumor cells (if present). We have abandoned the use of local anesthesia in the removal of suspected melanomas for this reason. There is no definite proof that the local anesthetic will cause metastases sooner but, in cases of malignant tumors, we believe that the use of general anesthesia rather than local infiltration will put all the factors in the patient's favor.

In taking a biopsy one must think about the time interval between the biopsy and the start of definitive treatment. Every lump, mass or growth of any kind should be considered malignant by the examiner until histologic proof is present; also, the patient should have some idea what will happen after the biopsy has been taken. It is probably better surgery to do most or all biopsies in a hospital. Tumors of the breast and thyroid, especially, should not be cut into unless the patient and the surgeon are prepared for immediate radical surgery should the growth and histologic section prove malignant as shown by frozen section.

Biopsies of the lip, bladder, skin, cervix and rectum may be done in the office or the clinic, if necessary. However, a minimum of time (not more than from three to six days) should elapse before these patients are given definitive treatment in a hospital. Even in these cases, it is probably better judgment to do the biopsy in a hospital rather than wait too long for a report from a laboratory.

There is hardly any excuse for not taking a biopsy of a suspicious visible lesion even if one is practicing in a small community without the benefit of a resident pathologist. A small lesion may be excised and placed in 10 per cent formalin (which any druggist can make up). This specimen may then be sent or taken to a pathologist and a report should be back to you not later than from three to six days usually. The patients with larger lesions and the deep seated lumps or masses should be hospitalized from the beginning.

Early diagnosis and early adequate treatment can be offered the cancer patient today. Until another method comes along, the biopsy is the most certain aid in the diagnosis of cancer. Early biopsy of suspicious lesions will put one on the right road to adequate treatment and offer a better prognosis to the patient.

At present, there are several ways in which one may obtain tissue for histologic study. One may use the incisional method, removing the lesion with a knife, actual cautery or electric cautery. There are also several types of instruments made with which one can obtain a so-called "punch" or "biting" biopsy. Likewise, small bits of tissue may be taken by means of a curette. Then, too, one can obtain some information from abnormal body fluids or discharges by aspiration and study of smears. Bone marrow puncture and the study of the smears may also help. Any or all of these procedures and others may be used in an effort to make the diagnosis of a suspected early cancer.

DISCUSSION OF METHODS

Incisional.—Surface lesions are best removed by the scapel or electric cautery. At times, removal with the electric or actual cautery tends to cook the lesion and distort the microscopic appearance of the biopsy. When taking a biopsy from lesions which are visible, we believe from a surgical and pathologic viewpoint, that it is much better to remove the entire lesion if at all possible. A reasonable margin of normal tissue should be included in all biopsies. Small bits of tissue taken from the edge of a lesion do not help the disposition of the pathologist nor the best interests of the patient. Most pathologists like to examine the lesion as it appears on the patient and would rather have the whole lesion along with some normal tissue for microscopic examination. From the standpoint of the surgeon, we believe complete removal of the lesion with one visit to the operating room is the best procedure to follow, as a rule. Small biopsies or wedges of tissue from the growing edge of suspicious lesions may cause an otherwise slow growing tumor to acquire sudden antagonistic characteristics. Biopsies consisting of small wedges or bits of tissue may show a positive diagnosis just as clearly as large sections but, in an undiagnosed lesion, a negative diagnosis arrived at by the study of these small wedges or bits of tissue is not at all conclusive. The only thing to be done then is to obtain another and more substantial biopsy.

Punch Method.—Another way to obtain a biopsy is by the punch method. In this type, a core of tissue is brought out through an instrument, usually consisting of a tube inside of another tube with the inner tube equipped with a knife or pointed edge to go through the skin into the deeper structures beneath the skin and even into the abdominal cavity. This type of biopsy is done on masses or lumps which can be felt but not seen. Biopsies of the liver are done frequently by the punch method. The procedure, although carried out with special reference to the anatomy of the individual, is, nevertheless, done more or less blindly by the operator. Here, too, a negative report means nothing except that another punch biopsy may be indicated. This method of obtaining tissue for study is not without danger to the patient from both internal hemorrhage and infection. It should be done

only by those experienced in its use and by those aware of the severe complications which may arise. Indiscriminate use of the punch biopsy for diagnosis of liver disease will only lead to bad results and severe complications for the patient.

Biting Method.—Another method of biopsy is done in any lesions of the pharynx, cervix and urinary bladder. This procedure is accomplished by means of a special type of instrument consisting of biting jaws manipulated at the other end by the operator. Many such instruments are on the market today. The specimens procured by such instruments are not large. Several "bites" should be taken of the suspicious tissue. Subsequent specimens may be necessary. There is always the danger of hemorrhage, infection or spread of tumor present after a "bite" has been taken. Definitive treatment should not be delayed too long.

STUDY OF ABNORMAL COLLECTIONS OF FLUIDS

Occasionally, and more often now with the improvement of technics, aspiration of the pleural cavity or of cystic spaces or paracentesis of the abdominal cavity may yield some information regarding the cause of the abnormal collection of fluids in these cavities. Tumor cells discovered in the specimens may point the way to a diagnosis of cancer. Aspiration biopsy usually is accomplished by using a good sized needle and drawing off the fluid with strong suction. The collected fluid is then centrifuged and the sediment fixed in paraffin. Sections are then cut, stained and studied. The results are not too conclusive; a negative report does not mean that the patient is free of cancer. Sometimes tumor cells are found and a positive diagnosis can be made.

Curettage is used almost exclusively in obtaining specimens from the cervix, cervical canal or from suspected lesions within the uterine cavity. Curettement of other lesions, as an old sinus tract, may sometimes be done.

CELLULAR STUDY

Recently, there has been added to present knowledge another method of biopsy which may be called a cellular biopsy, the smear or cytologic technic introduced and developed by Papanicolaou. He developed the cervical and vaginal smear test and now employs the smear test on cytologic study to include the urine, gastric contents and sputum. The study of the secretions and cells from the bronchi, the rectal and anal mucosa has been emphasized by other workers. Meigs reports 2,749 cases in which the smear test was used in suspicious cases of cancer of the uterus and claims that the percentage of error was about 3.2. He states that the nucleus of the cells is the main diagnostic criterion. He also says that a negative report does not exclude the possibility of cancer. He favors a biopsy in all cases in which the smear test was positive. It is well to remark here that accuracy of the diagnosis in these cases depends on the training and ability of the pathologist reporting the results.

BIOPSIES AS APPLIED TO VARIOUS ORGANS OR REGIONS

Skin.—Probably more biopsies are taken from the skin than any other organ or region of the body. Sections of lymph glands and uterine scrapings are just as common.

Small lesions of the skin can be excised completely by the scapel or electric cautery. A good margin of normal tissue, at least a centimeter or two in all directions, should be included. When the lesion is fairly large, the entire lesion plus a comfortable margin should be removed in the operating room. There is no objection to immediate skin grafting in such cases, if necessary. Cutting small wedges or bits of tissue from the edge of a suspected malignant area of a skin lesion is not a good surgical procedure. If the lesion is suspicious enough to warrant a biopsy, it is poor judgment to tease the malignancy along by taking a wedge from the edge of the area. The danger of flaring up a slow growing process to an overactive death-dealing disease is always present. Nor should cosmetic result be an excuse when dealing with cancer anywhere in the body. Small wedges of tissue do not lend themselves readily to microscopic study. Here, too, a negative diagnosis means nothing except that the small wedge of removed tissue showed no cancer. Cancer may be present a slight distance away in the portion of the lesion which was allowed to remain.

At times the use of the electric cautery is detrimental in that the specimen is too well cooked to show the pathology in its true light. Sometimes, because of the heat and subsequent slough, the wound will take longer to heal than in clean wounds made with the scapel.

Lip.—Lesions of the lip usually are not large or of long duration before the patient seeks the advice of his doctor. It is well to remember that syphilis of the lip can occur, both as a primary ulceration and in the later stages; likewise, that syphilis and cancer can occur in the same individual and at the same time. Biopsy of lesions of the lip is probably best done by small V excisions of the entire lesion and a margin of good tissue. The scapel is the best instrument, although some men use the electric cautery. Subsequent suture of the lip should leave little scar and only slight difference in the size and shape of the lip. One should not neglect close examination of the submental, submaxillary and cervical regions in all suspicious lesions of the lip.

Buccal Mucosa and Tongue.—Lesions of the buccal mucosa and tongue are probably best biopsied by using the electric cautery. The buccal mucosa and tongue, particularly the latter, are vascular areas. Hemorrhage is better controlled by use of the electric cautery and coagulator. If possible, the lesion of the buccal mucosa or tongue should be removed entirely with a margin of good tissue.

Large defects will take a while to heal. Suturing may be attempted, but the sutures will usually slough out before healing occurs. It is probably a better practice to coagulate all bleeding points after the biopsy has been taken, suture as well as possible and allow the remaining part to heal by granulation. Small lesions of the buccal mucosa may be excised and sutured. Likewise, lesions of the anterior portion of the tongue may be excised with a comfortable margin and the defect sutured. In case the biopsy is positive for cancer, it is wise to protect the patient further by treatment with radium or radon seeds even though the surgeon feels that he has removed enough tissue.

Nasopharynx and Pharynx.—Tumors of the nasopharynx may attain a large size before they are suspected or discovered. In fact, the first indication of a tumor in the nasopharynx may be the appearance of a large hard mass in the neck. Tumors of the tonsillar area, nasopharynx or hypopharynx are usually highly malignant but, in general, most of them are highly radiosensitive. They are not easily accessible to complete radical surgery. Biopsy by one of the biting types of instruments may be done but the electro-coagulator may be needed to control hemorrhage.

Larynx.—Tissue specimens can be obtained by using one of the biting types of instruments, either with the aid of a laryngeal mirror or the laryngoscope. A cocaine spray can be used to anesthetize the pharynx and larynx. The utmost patience is needed by the operator and the highest cooperation from the patient to obtain good results. As yet, there has been no definite evidence to show that biopsies done on the vocal cords tend to increase the spread of malignancy.

Bronchi and Lungs.—Biopsies of the main bronchi may be done by use of one of the long biting types of instruments through the bronchoscope. Cooperation of the patient and skill of the operator will do much to lessen the unpleasantness of this procedure. Some authors have reported successful biopsies from the study of sputum after proper preparation and staining. Other men have used the centrifuged sediment of pleural effusions in their studies. If the pleural effusion smear is positive for carcinoma, thoracotomy is usually contraindicated.

Gastrointestinal.—Biopsies of the gastrointestinal tract are usually not obtained without abdominal surgery, except from the esophagus, rectosigmoid, rectum and anus. Lesions of the esophagus can be seen through the esophagoscope and a biopsy taken with one of the long biting forceps made for that purpose.

Biopsies of the mucosa of the stomach have been taken by means of different devices, the latest being one reported by a group of English workers. Most of these biopsies are taken blindly. The dangers of hemorrhage and perforation by the instrument should not be overlooked. X-rays, chemical analysis of the stomach contents, study of the paraffin sections of centrifuged gastric contents should aid one greatly in the search for a diagnosis. Any type of procedure or instrument which will help to diagnose early carcinoma of the stomach will be met with enthusiasm and should be tried to establish its worth. Most carcinomas of the stomach are now diagnosed much too late to be of benefit to the patient.

The small bowel and most of the colon do not lend themselves readily to biopsy unless the abdomen is opened. One must rely on his own observations and whatever help one can get from the radiologist.

Whether by design or fate, most of the tumors of the large bowel occur in the rectum and near the rectosigmoid juncture and, hence, may be visualized by using the long sigmoidoscope. Biopsies can be taken through the instrument by using one of the long biting forceps. Several pieces of suspicious tissue should be taken the first time to avoid a second unpleasant passage of the sigmoidoscope. The patient will appreciate this thoughtfulness.

Lymph Glands.—A patient may have enlarged lymph glands in various parts of the body. Unless the physician is well grounded in the fundamentals of lymph gland distribution and the usual routes of infectious and metastatic spread, he may do harm to the patient by doing a biopsy without proper preparation or study. After years of experience, the surgeon probably will find that the best procedure to follow in taking a biopsy of lymph gland is to use a general or local anesthetic and take more than one lymph node, the actual work being done in a hospital operating room.

Breast.—The best rule to follow in dealing with masses or lumps in the breast is to consider all masses carcinomatous until histologic section proves differently. The entire tumor mass should be removed by means of the scapel. The patient and the surgeon should be prepared for radical removal of the breast and axillary contents at the same time as the biopsy, if the study of the frozen section proves malignancy. It is better surgical judgment to call for frozen sections on all masses in the breast than to rely too much on gross and clinical appearance of the lesion, even though the operator is an expert. Frozen section followed by immediate radical surgery (if histologic examination is positive for carcinoma) will make all odds for survival favorable to the patients from the beginning.

Thyroid Gland.—Most carcinomas of the thyroid gland are discovered by the pathologist after the gland has been removed by the surgeon. Carcinoma of the thyroid, while not too common, should be considered in all long standing adenomatous goiters. Goiters in which there is a single nodule seem to be more likely to become carcinomatous than those glands with multiple nodules. It is better to remove all the lobe than to take only a small part of it for biopsy.

Genito-Urinary System.—Biopsies may be taken from the urinary bladder and prostate by means of the cystoscope and use of electric cautery. Several specimens should be taken.

Female Genital System.—Under direct vision biopsies of the vulva, urethral orifice, vagina and cervix may be taken easily with the scapel or electric cautery. Uterine curettage is used to obtain specimens of suspected lesions within the uterine cavity. The various smear technics or modifications of these also should be used.

Male Genitalia.—Incisional biopsies of the penis can be done readily. Tumors of the testicle are probably best handled by removal of the entire testicle.

Bone.—Biopsies of bone can be done by open operation and the defect filled with bone chips. X-rays of the suspected tumor will give most of the needed information to make a diagnosis of most bone lesions, but amputation for osteogenic sarcoma should never be done without preliminary biopsy. Most bone tumors can be identified by x-rays and biopsies. In bone tumors as well as any other lesion of the body, the final proof rests with biopsy of the lesion and study of the histologic section.

CONCLUSIONS

Tissue proof of the disease is the ultimate criterion in all diagnoses, especially in carcinoma. The earlier in the disease that one has a positive diagnosis, the sooner the patient will be treated. The number of five year survivors should then increase. The public is educated to be suspicious of an abnormal finding; physicians should not be less suspicious themselves. Physicians should be alert and never too busy to examine the patient thoroughly. One early cancer picked up in its beginning should stimulate all to be on guard at all times against methods which are slipshod. One cancer case found early and given adequate treatment early is worth a lifetime of seeking. The biopsy must be kept in mind. It is the best and most efficient method available to give an opinion as to the nature of suspicious lesions or abnormal findings.

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CYTOLOGICAL EXAMINATION REVEALS EARLY UTERINE CANCERS

Microscopic studies of smears taken directly from the uterine cervix and cervical canal are extremely useful in detecting early uterine cancer in women, according to two Cleveland physicians.

Drs. James W. Reagan and R. T. Schmidt, University Hospitals of Cleveland, report on the effectiveness of this so-called cytological technic in the January 13 *Journal of the American Medical Association.*

In a controlled series of tests, specimens taken from 108 proved uterine cancer patients were examined by this technic. Affirmative results were reported by Drs. Reagan and Schmidt in 103 of the 108 proved cases.

The accuracy and effectiveness of this method require a highly skilled microscopist trained in cell research. In addition much care must be taken in obtaining the specimen and in preparing the tissue spreads for examination.

The report said: "The cytological technic is useful in the identification of uterine neoplasms and may reveal the presence of lesions unrecognized with the use of endometrial curettage or cervical biopsy."

PANCREATIC DYSFUNCTION AND LIVER DISEASE

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SIGNIFICANT ADVANCES have been made in knowledge of the etiology and pathogenesis of liver and pancreatic diseases and in the functional relationship that exists between the two organs.[1, 6] Animal studies by Chaikoff et al,[1, 2, 5] Best,[3] Gilman,[4, 5] Ivy[6] and others have shown that fatty deposition

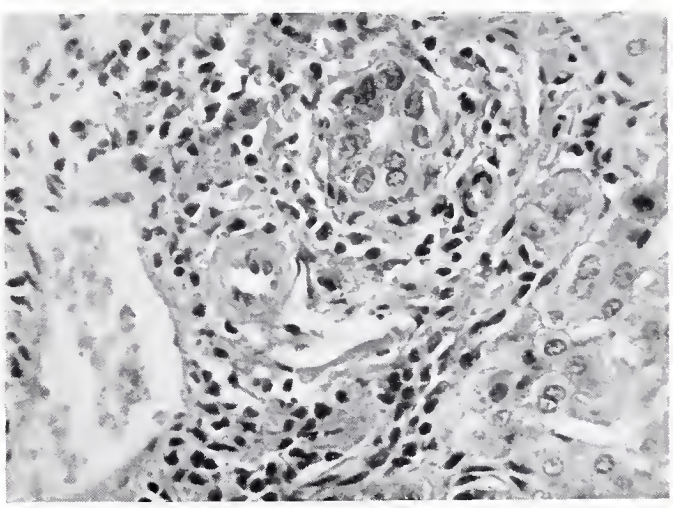


Fig. 1. Section of liver shows well preserved cord cells and the mixed inflammatory cell exudate in the portal area. Mild increase in the amount of fibrous connective tissue is also present. (700x.)

or fibrosis of the liver may follow inflammatory changes in the pancreas, pancreatic duct ligation and pancreatectomy in dogs maintained on a diet of lean meat and insulin. These hepatic changes could be prevented by the addition of pancreatic tissue or lipotropic agents to the diet.

Chaikoff and coworkers[5, 7, 8] have demonstrated further that in hypophysectomized, thyroidectomized dogs and in depancreatized dogs a periportal inflammatory cell infiltration, bile duct proliferation and periportal fibrosis may result which, in the initial stages, closely resembles the early phases of the cholangiolitic type of cirrhosis observed in human subjects by Watson and Hoffbauer.[9] In the later stages the picture is that of structural distortion with portal fibrosis and bile duct hyperplasia. These changes may or may not be preceded by a fatty liver. Experimentally, there appears to be sufficient evidence to indicate that disturbance in pancreatic function may produce functional and structural liver disease.

That certain pancreatic diseases in the human,

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Read in part before the Central Society for Clinical Research, Chicago, November 4, 1950.

such as diabetes mellitus, acute pancreatitis and pancreatic insufficiency, are accompanied by demonstrable hepatic changes is recognized,[12] but pancreatic dysfunction as a not infrequent cause of serious permanent liver damage has largely been overlooked.

The use of frequent serum diastase determinations and the prostigmine diastase test has increased the accuracy and incidence of the diagnosis

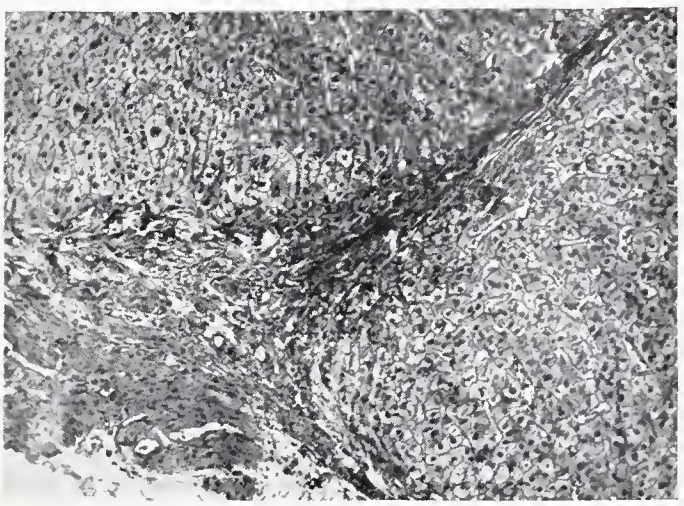


Fig. 2. Reveals well preserved liver cord cells; increase in fibrous connective tissue and inflammatory cell infiltration in portal spaces. (200x.)

of pancreatic dysfunction and has made it possible to detect abnormalities of the pancreas in the presence of other diseased organs in the upper abdomen.[10, 11]

The following case histories and laboratory data of seven patients lead us to suspect that pancreatic dysfunction is an important etiologic factor in chronic liver disease. The diagnosis of pancreatic and liver disease, established by the clinical history, elevated random diastase determinations, abnormal prostigmine diastase tests and liver profiles, were confirmed by surgical exploration and biopsy.

REPORT OF CASE

Case 1. E. R., a 65 year old white female, entered the hospital with a history of chronic recurrent attacks of upper abdominal pain, dyspepsia, nausea, vomiting, 60 pound weight loss, constipation, light colored stools, jaundice, dark urine, fever, malaise and weakness of fifteen years' duration. She also gave a history of multiple food intolerances and drug sensitivity.

Physical examination revealed the patient to be emaciated, mildly icteric with hepatic facies and spider angiomata. The liver was palpable to the umbilicus and slightly tender. The temperature, pulse and respiration were normal.

A nonvisualizing gallbladder and a normal gastrointestinal series were reported by x-ray.

Laboratory Studies.—Red blood cell count was 2,930,000; hemoglobin 8.5 grams; white blood cell count 12,000; serum bilirubin 4.8 mg.; cholesterol 228 mg.; cephalin cholesterol flocculation 2 plus at 24 hours, 3 plus at 48 hours; thymol turbidity 16 units; albumin 3.7 grams; globulin 3.89 grams; prothrombin time 88 per cent. Urobilinogenuria and bilirubinuria were present.

Random serum diastase values were 290 U, 228 U, 259 U, 533 U, 250 U (Somogyi units).

Prostigmine diastase test (Somogyi units):

	F	30′	60′	90′	120′
Preoperative	533	533	533	380	355
Postoperative	1060	933	933	800	1030

Findings at exploratory laparotomy showed the pancreas enlarged and firm with irregular surface. The bile ducts were dilated without evidence of stone or stricture. There was cirrhosis of the liver.

Microscopic examination of the liver (fig. 1) showed well preserved liver cord cells with some evidence of cell regeneration. There was a definite increase in the amount of periportal fibrous tissue and a mixed inflammatory cell infiltration in the portal areas. Moderate bile retention in the bile capillaries was present. Biopsy of the pancreas was not done.

Diagnosis.—Portal cirrhosis, mild; pericholangitis; bile retention, mild.

Case 2. E. J., a 48 year old white female, was admitted to the hospital because of chronic recurrent attacks of pain in the upper abdomen and back, jaundice, pruritus, bleeding from the nose, mouth and gastrointestinal tract, anorexia, dyspepsia, constipation and marked weight loss since 1940. Prior to splenectomy in 1943 for suspected Banti's disease, the patient had repeated elevated serum diastase values. Splenectomy did not change her clinical course.

Physical examination, for the period of 1944 to 1948, revealed a well developed, poorly nourished to emaciated white female. Temperature, pulse, respiration and blood pressure remained within normal limits. A progressive pigmentation of the skin as well as a

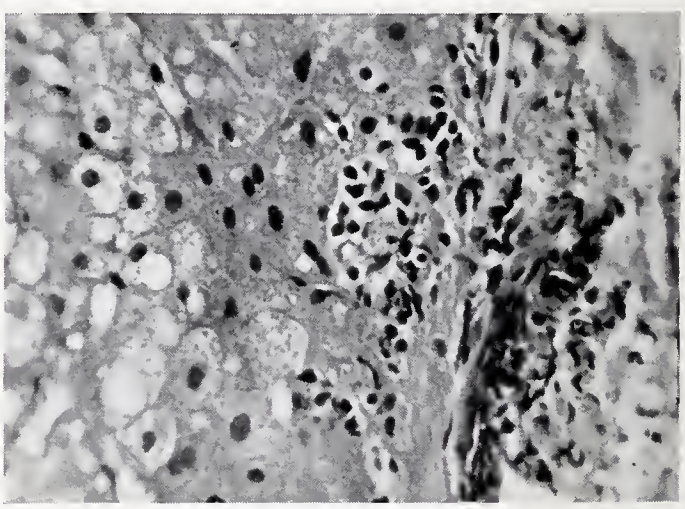


Fig. 3. Section of liver showing a moderate amount of fatty infiltration of liver cells, mixed inflammatory cell exudate in portal areas. (700x.)

progressive enlargement of the liver to the umbilicus was noted. The liver was nodular and moderately tender. The degree of icterus and ascites varied.

Repeated x-ray studies of the gastrointestinal tract, the gallbladder and the chest were normal.

Laboratory studies (March 1944 to December 1948) showed white blood cells 6,100; red blood cells varied from 1,900,000 to 4,570,000; hemoglobin from 7.5 to 13.4 grams; platelets from 600,000 to 190,000; bleeding and clotting times normal; prothrombin time from 45 to 100 per cent; red blood cell fragility test normal; occult

blood in stool positive; nonprotein nitrogen 27; blood sugar 105 mg. per cent.

Random serum diastase values were: 127 U, 400 U, 380 U, 420 U and 267 U (Somogyi units).

Prostigmine diastate test (Somogyi units):

F	30′	60′	90′	120′
457	433	378	378	353

Liver function test:

	1944	1945	1948
Icterus Index	5-68 U	5-8 U	25 U
1′ Bilirubin		0.8	1.7
Total Bilirubin		1.0	5.5
Albumin	2.5 gm. 100 cc.	3.07 gm. 100 cc.	2.7 gm. 100 cc.
Globulin	2.7 gm. 100 cc.	5.64 gm. 100 cc.	5.7 gm. 100 cc.
Cholesterol	333,600 mg. 100 cc.	280 mg. 100 cc.	258 mg. 100 cc.
C.C.F. 24/48 hr.	1+/1+	2+/2+	2+/3+
Thymol Turbidity		12 U	10 U
BSP 30′		45 per cent	38 per cent
Bilirubinuria	Pos.		Pos.
Urobilinogen		Inc.	Inc.
Prothrombin Time	71 per cent	60-100 per cent	45 per cent

Microscopic sections of the liver, obtained by needle biopsy (fig. 2), revealed a fibrosis of the portal spaces and an infiltration with mixed inflammatory cells. The liver cells were well preserved.

Diagnosis.—Portal cirrhosis, severe; pericholangitis.

Case 3. W. K., white male, aged 67, was admitted to the hospital with a history of chronic recurrent attacks of upper abdominal pain, belching, bloating, fullness, vomiting, constipation, jaundice, dark urine, light colored stools and weight loss of many years' duration. In 1948 a gastrointestinal x-ray series and barium

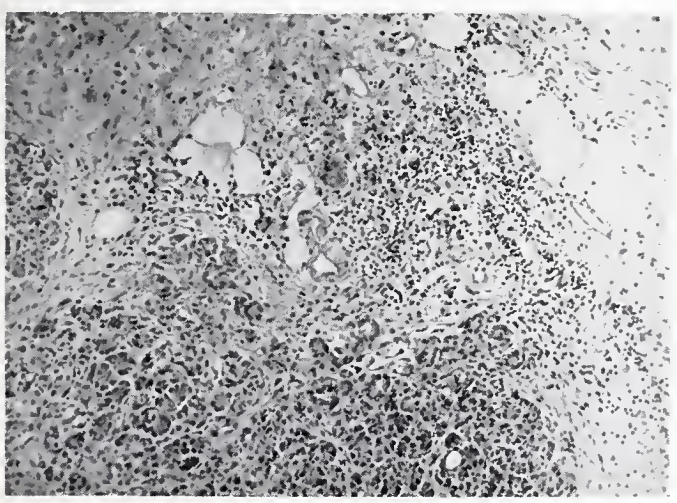


Fig. 4. Section of pancreas revealing interstitial infiltration with acute and chronic inflammatory cells, as well as moderate interstitial fibrosis. (200x.)

enema gave normal findings. A nonvisualizing gallbladder was reported. An exploratory laparotomy (1948) revealed cholelithiasis and the gallbladder was removed at that time. The patient's clinical course continued unchanged and one year later he was readmitted to the hospital for study.

At examination evidence of weight loss was noted. The liver was palpable from 12 to 14 cm. below the coastal margin and was moderately tender.

Laboratory Studies.—Red blood cells were 3,340,000; hemoglobin 12.0 grams; white blood cells 11,000; bromsulfathalein 29 per cent retention 30 minutes; cephalin cholesterol flocculation 2 and 4 plus at 24 and 48 hours; thymol turbidity 3.2 units; albumin 4.3 grams; globulin 2.47 grams; alkaline phosphatase 9.6 Bodansky units; total cholesterol 8.4 mg. per 100 cc.; cholesterol esters 52 mg. per 100 cc.; 1 minute bilirubin 5.0 mg.; total 8.4 mg.; prothrombin time 100 per cent; urine urobilinogen and bilirubin were positive.

Random serum diastase values were: 68 U, 211 U, 195 U, 499 U, 91 U, and 380 U (Somogyi units).

Prostigmine diastase test (Somogyi units):

F	30′	60′	90′	120′
115	115	115	115	115

Exploratory laparotomy revealed the head of the pancreas to be greatly enlarged and indurated, suggestive of malignancy. The liver was enlarged and nodular.

Microscopic examination of the liver (fig. 3) showed a moderate number of large fatty vacuoles replacing the liver cells. Some inspissated bile was noted in the bile capillaries and many chronic inflammatory cells were present in the portal spaces.

Diagnosis.—Fatty infiltration, moderate; bile retention, mild; pericholangitis.

Microscopic sections of the pancreas (fig. 4) showed moderate interstitial fibrosis with marked infiltration, with acute and chronic inflammatory cells.

Diagnosis.—Interstitial pancreatitis.

Case 4. H. H., white female aged 30, was hospitalized because of fever, malaise, anorexia, nausea, vomiting, constipation, pruritus, epigastric pain radiating to back and right flank, jaundice and weight loss of two months' duration. There were also intermittent periods of dark urine and light colored stools.

At examination the patient was found to be well developed, thin, and appearing ill. Skin abrasions and a deep icterus of the skin and sclerae were present. The liver was palpable three fingers below the costal margin and was tender. There was tenderness over the entire abdomen and an area of hyperesthesia over the twelfth thoracic and second lumbar vertebrae.

X-ray Studies.—A nonvisualizing gallbladder was reported.

Laboratory Studies.—White blood cells were 7,600; segmented 68 and lymphocytes 32; red blood cells 4,500,000;hemoglobin 13.5 gms.; nonprotein nitrogen 30; alkaline phosphatase 14.8 Bodansky units; albumin 3.9

gms. and globulin 2.7 gms.; cholesterol (total) 200 mg. per 100 cc.; prothrombin time 100 per cent; cephalin cholesterol flocculation 1 and 2 plus for 24 and 48 hours; thymol turbidity 4.0 U; icterus index 125 U; bromsulfathalein 46 per cent, retention 30 minutes; urine urobilinogen negative; bilirubin positive; stool urobilinogen less than 5 mg. per cent.

Random serum diastase values: 160 U, 206 U, 291 U, 304 U, 457 U, 246 U (Somogyi units).

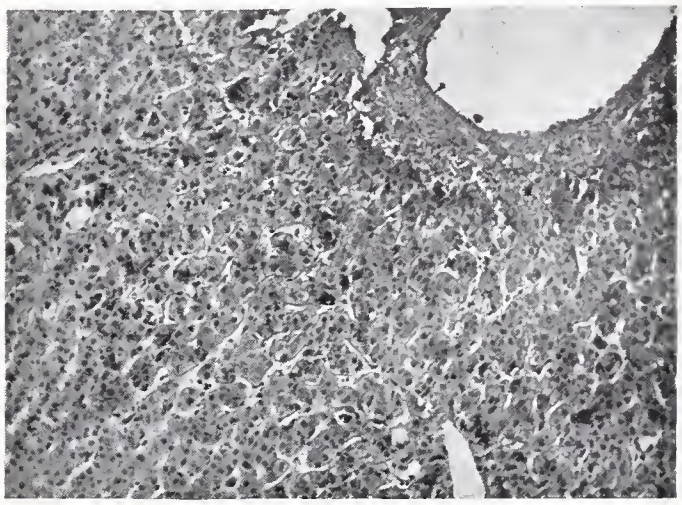


Fig. 5. Section of liver showing bile retention in canaliculi and a moderate amount of periportal inflammatory cell infiltration. (200x.)

Prostigmine diastase test (Somogyi units):

	F	30′	60′	90′	120′
Preoperative	160	213	214	158	165
Postoperative	291	291	457	520	710

Operative Findings.—At operation the liver was found to be enlarged, dark purple with round edges, firm and injected with irregular surface. The common bile duct was dilated 2½ cm.; the gallbladder wall was thickened and contained clear bile. The pancreas was firm and enlarged with smooth irregular surface.

Microscopic sections of the liver (fig. 5) revealed bile retention in the bile capillaries and canaliculi. The portal spaces showed mixed chronic inflammatory cell infiltration. The liver cells were well preserved.

Diagnosis.—Bile retention, marked; pericholangitis.

Case 5. M. M., white male, aged 38, since 1945 had had three severe attacks of nausea, anorexia and vomiting accompanied by epigastric pain radiating to both upper quadrants and substernal area with dyspnea, jaundice, extreme weakness, fatigue and malaise. The patient denied the use of alcoholic beverages.

At examination, generalized abdominal tenderness, marked in the epigastrium and both upper quadrants, was noted. The liver was palpable and tender 8 cm. below the costal margin.

Laboratory Studies.—White blood cells were 7,800; red blood cells 3,700,000; hemoglobin 11 gms.; urine urobilinogen increased; bilirubin negative; cephalin cholesterol flocculation 4 plus; thymol turbidity 5.3 units; alkaline phosphatase 4.6 Bodansky units; albumin 3.0 gms.; globulin 3.2 gms.; cholesterol 133 mg. per 100 cc.; cholesterol esters 66 mg. per 100 cc. (50 per cent); serum bilirubin, total 1.6 mg., 1 minute 0.9 mg.; prothrombin time 70 per cent.

Random serum diastase values: 238 U, 240 U, 320 U (Somogyi Units).

Prostigmine diastase test:

F	30′	60′	90′	120′
317	317	380	380	317

Microscopic sections of the liver obtained by needle biopsy (fig. 6) showed an increase in the periportal fibrous tissue with some infiltration of lympocytes, monocytes and an occasional polymorphonuclear leukocyte and eosinophil. The liver cells were somewhat vacuolated.

Diagnosis.—Portal cirrhosis; pericholangitis.

Case 6.—J. S., white male, aged 36, with history of epigastric pain of an indefinite duration accompanied by qualitative and quantitative indigestion, entered the hospital in mild shock, abdominal rigidity, nausea and vomiting.

Exploratory laparotomy revealed an enlarged cirrhotic liver, a large firm pancreas and a ruptured gastric ulcer. Recovery was uneventful.

Examination one month later revealed the liver to be palpable 10 cm. below the costal margin and tender.

Gastrointestinal x-ray series was negative except for 10 per cent gastric residue at five hours.

Gastroscopic examination revealed a normal stomach.

Laboratory Studies.—Cholesterol 247 mg. per cent; cephalin cholesterol flocculation 2 and 4 plus at 24 and 48 hours; thymol turbidity 13 U; thymol flocculation positive; alkaline phosphatase 3.5 U; albumin 3.45 gms. per cent; globulin 3.8 gms. per cent; bromsulfathalein 6 per cent, dye retained 30 minutes.

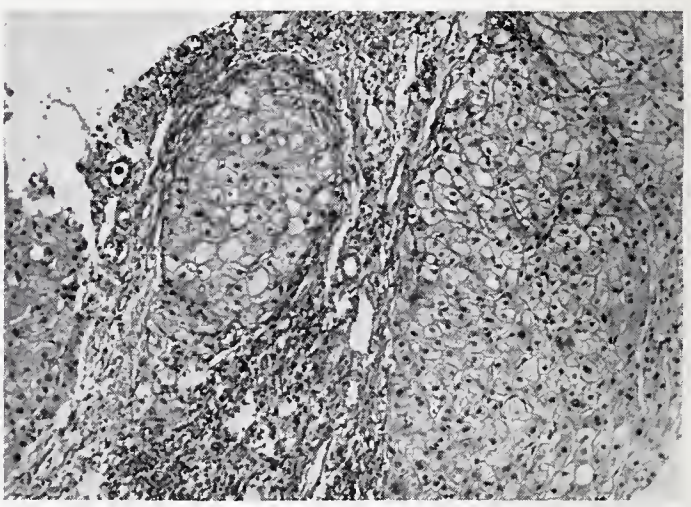


Fig. 6. Section of liver showing an increase in periportal fibrous tissue with lobular distortion and pronounced periportal infiltration with inflammatory cells. (200x.)

Random serum diastase values: 300 U, 300 U (Somogyi units).

Prostigmine diastase test (Somogyi units).

F	30′	60′	90′	120′
233	310	400	467	467

Microscopic seetions of the liver (fig. 7) showed a marked infiltration of the portal spaces with lymphocytes, monocytes and polymorphonuclear leukocytes. No fibrosis was noted. The liver cord cells were well preserved.

Diagnosis.—Pericholangitis.

Case 7.—C. D., a 64 year old white male, for five years had had recurrent attacks of epigastric pain, heartburn, soreness in stomach, gas, bloating, nausea, belching, anorexia and 21 pound weight loss. The dietary history was adequate and he drank two or three beers several times a week.

Upon examination there was evidence of weight loss—normal weight 150 pounds, present weight 129 pounds. The liver was palpable from three to five fingers' breadth below the costal margin and was not tender. There was moderate epigastric tenderness. The axillary and pubic hair was sparse.

Laboratory Studies.—Red blood cells were 4,200,000; hemoglobin 84 per cent; white blood cells 7,350; urine bilirubin negative; urobilinogen positive; cephalin cholesterol flocculation 3 plus 24 and 48 hours; thymol turbidity 4.3 U; thymol flocculation negative; alkaline phosphate 1.2 Bodansky units; albumin 5.10 gms.; globulin 2.60 gms; cholesterol 194 mg. per 100 cc. cholesterol esters 124 mg. per 100 cc. or 75 per cent; serum bilirubin total 1.2 mg.; 1 minute 0.1 mg.; blood sugar 57 mg. per cent; prothrombin time 100 per cent.

Random serum diastase values: 238 U, 380 U, 475 U, 317 U, 173 U (Somogyi units).

Prostigmine diastase test (Somogyi units):

F	30′	60′	90′	120′
317	380	317	317	271

Microscopic sections of the liver (fig. 8) showed a fatty infiltration with many liver cord cells replaced by fat vacuoles. Periportal inflammatory cell infiltration was minimal.

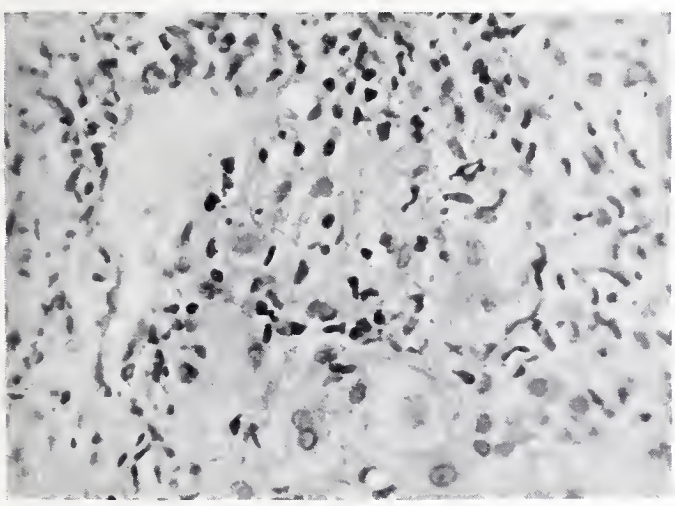


Fig. 7. Section of liver revealing infiltration of the portal spaces with inflammatory cells, including polymorphs. (700x.)

Diagnosis.—Fatty infiltration, marked; pericholangitis, mild.

DISCUSSION

The cases cited present the following evidence of pancreatic and liver dysfunction and structural changes: (1) a clinical history consistent with pancreatic disease, hepatic disease or biliary obstruction; (2) repeated abnormal random serum diastase values (3) abnormal liver function tests with biopsy evidence of structural liver damage.

In none of the cases could the usual etiologic agents of liver disease such as toxins, infection or malnutrition, with or without alcoholism, be elicted.

The elevated serum diastase values which occurred at intervals in these patients, as well as the abnormal prostigmine diastase curves, were at variance with low serum diastase values usually found in patients with damaged livers.[10, 13]

The pathologic findings in the liver biopsies ranged from the periportal inflammatory cell infiltration, similar to that seen in cholangiolitic hepatitis, to the marked fibrosis of advanced hepatic cirrhosis and fatty infiltration.

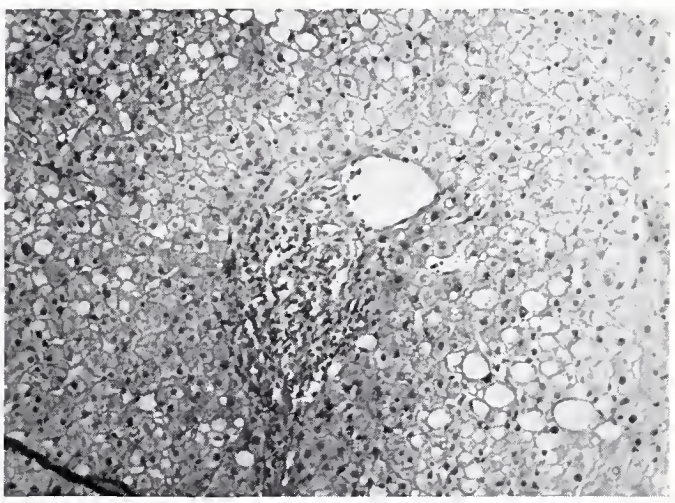


Fig. 8. Section of liver showing fatty replacement of many cord cells and periportal inflammatory cell infiltration. (100x.)

The etiology of pancreatitis is unknown and the pathogenesis of liver disease in these patients is obscure. However, recent experimental work and past clinical experience lead us to suspect that several mechanisms are involved. Repeated biliary obstruction due to pancreatitis or other causes no doubt plays a contributing role in some cases. The exact role of lipocaiac and other pancreatic enzymes in the production of liver disease is not well understood, but experimental evidence suggests that these agents are important in maintaining normal hepatic function and structure.[14, 15, 16, 17] In pancreatic disease there may be an alteration in these factors.

In the cases presented it is difficult to rule out the possibility that the disease process may not have originated in the liver or that the pancreas and liver were not involved simultaneously by a common etiologic agent. However, our experience with serum diastase levels and the prostigmine diastase test lead us to suspect that under such circumstances these tests would be in the normal or low range. Therefore, it seems to us that the pancreatic disturbances could well be the initiating or deciding factor in the devolopment or progression of the pathologic processes in the liver.

SUMMARY AND CONCLUSION

Seven patients with clinical and laboratory findings indicative of pancreatic and liver dysfunction with structural changes in the liver and pancreas have been presented and the possible role of pan-

creatic dysfunction in the pathogenesis of liver disease has been discussed.

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ANOTHER STUDY SHOWS ANTIHISTAMINICS INEFFECTIVE IN TREATMENT OF COLDS

Carefully controlled studies conducted at the University of Illinois College of Medicine and the Chicago College of Optometry "demonstrate that antihistaminic drugs do not prevent, abort, shorten, curtail, reduce or stop the common cold," according to Dr. Noah D. Fabricant of Chicago.

Dr. Fabricant, clinical assistant professor of otolaryngology at the university, reported these findings in the A. M. A. *Archives of Otolaryngology*. He confirmed numerous similar studies in the United States and Great Britain.

"It was observed," he said, "that antihistaminic drugs are no more effective than placebos in aborting a cold and that there is no validity to the contention that antihistaminic drugs are more effective if taken within a short time after the start of a cold."

He cited like findings in other studies and added that "sufficient time has elapsed and enough convincing evidence has been accumulated" to establish the ineffectiveness of the drugs in the treatment and prevention of colds.

Dr. Fabricant's studies involved 139 students at the Chicago College of Optometry and seventy-four students at the University of Illinois College of Medicine. They were conducted through the winter and early spring of 1950.

TREATMENT OF HEADACHE

FOUR NEW AGENTS COMPARED WITH CAFERGOT AND E.C.B.-210

ROBERT E. RYAN, M.D.
ST. LOUIS

Recently patients with migraine and histaminic cephalgia have obtained considerable relief by using a new preparation called Cafergot. Cafergot may abort or stop attacks but it does not cure. Cafergot gives good results in migraine and histaminic cephalgia but is of little value in other types of headaches.

Cafergot consists of 1.0 mg. ergotamine tartrate and 100.0 mg. of caffein and is a sugar coated tablet. The average dosage of Cafergot is two tablets at the immediate onset of the headache. If taken after the attack is well developed it has little if any effect.

Cafergot has been found to cause some toxic side effects in about 10 per cent of the patients who use it. The side effects consist entirely of gastric distress, nausea and abdominal cramps. No vomiting was experienced in any of the reported cases.[1,2] Many patients who experienced side effects received some benefit from the Cafergot however.

The problem, therefore, seemed to be to find a combination of these two drugs, or a method of administering these drugs which will not produce these side effects. Therefore the manufacturers of Cafergot prepared a new tablet known as E.C.B.-210. This tablet contained the same amounts of ergotamine tartrate and caffein as Cafergot. In addition it contained 0.125 mg. of Bellafoline. This preparation was found to reduce the gastric side effects to about 5 per cent, which was an improvement over Cafergot.[3]

Bellafoline inhibits parasympathetic nerve impulses, relieves smooth muscle spasm and also controls hypersecretion. Bellafoline has been found to have the most prolonged effect in decreasing peristalsis and muscle tone of all the antispasmodics.[4] Bellafoline has been found to have a strong inhibitory effect upon the vagus nerve; in fact, about twice that of atropine and it is only one half as toxic when given in the same dose.[5]

Ergotamine tartrate is a sympathetic sedative and Bellafoline is a vagal sedative. Caffein has a central stimulant action.

With Cafergot (experimentally known as E.C.-110) side effects were experienced in from 10 to 11 per cent of patients. With E.C.B.-210 the side effects were experienced in only 5 per cent. However, there were still side effects and it was desired to eliminate these entirely. The next step taken was to administer the medication in suppository form. It was thought that by administering the drug in this form, gastric side effects might be lessened or eliminated.

Four types of suppositories have been prepared. They are experimental drugs and are designated by numbers.

The suppository known as E.C.-112 contains 2.0 mg. of ergotamine tartrate and 100 mg. of caffein. Thus it has the same amount of caffein as Cafergot and E.C.B.-210 but twice as much ergotamine tartrate. It is in a fat soluble base.

Suppository E.C.-222 contains 2.0 mg. ergotamine tartrate and 200 mg. caffein. Thus it has the same amount of ergotamine tartrate as E.C.-112 but twice as much caffein. One suppository of E.C.-222 was equal in strength to two tablets of Cafergot, which is the prescribed dosage of Cafergot.[2]

Suppository E.C.B.-115 contains 2.0 mg. ergotamine tartrate, 100 mg. caffein and 0.25 mg. Bellafoline. This suppository is similar to the oral tablet E.C.B.-210, having the same amount of caffein but exactly twice as much ergotamine tartrate and Bellafoline. If this preparation had 200 mg. caffein in place of 100 mg. it would be equal to two tablets of E.C.B.-210 which constitutes the prescribed dosage of E.C.B.-210.[3]

The fourth suppository, DHEC=1 differs from the other three in that it contains 100 mg. of caffein but in place of ergotamine tartrate it contains 4.0 mg. of dehydroergotamine methanesulfonate. Therefore, this suppository is closely related to DHE-45 (dehydroergotamine tartrate) which was first reported in 1942 as being beneficial in the relief of migraine attacks.[6]

It has been noted that Cafergot and E.C.B.-210 are of benefit only in cases of migraine, histaminic cephalgia and to some extent in tension types of headaches and the suppositories were used only in these.

All patients in this series were instructed to take one suppository rectally at the immediate onset of their headache attack. Many patients took a second suppository one hour after the first but it was rare to find a patient who obtained results from the second suppository if the first failed. It seemed, therefore, that if relief from the headache is to be obtained it will be from the first suppository or not at all.

Migraine headache is usually hemicranial and usually is associated with nausea, vomiting, scotomata, photophobia and a family history of similar headaches. It is somewhat periodic and usually the duration is for many hours or days. Migraine attacks are seen in women more often than in men, in a ratio of more than two to one. In women the attacks are often more severe at the beginning or during menstruation.

Histaminic cephalgia as described by Horton[7] is characterized by a unilateral headache which usually begins in the later decades of life. It is of short duration, generally lasting less than an hour. It commences and often terminates suddenly. It tends to awaken the patient at night one to two hours after he has gone to sleep and frequently is eased by the patient sitting up or standing erect. It is associated with profuse watering and congestion of the eye, rhinorrhea or stiffiness of the nostril, increased surface temperature and often swelling of the temporal vessels of the involved side of the head. Pain is the outstanding complaint. It is constant, excruciating, burning and boring in character. The pain involves the eye, temple, neck and often the face.

The tension type of headache may be localized or generalized as any vessel may be the origin of the pain. The headache is not caused by nervous tension per se which gives rise to a state of hypertonicity but by the hypotonicity or vasodilation which follows the hypertonicity or vasoconstriction. Pain does not occur during the vasoconstriction phase but follows shortly thereafter and is a vasodilating phenomenon.

Table 1. **Results of Administration of E.C.-112 in Cases of Headache**

Type of Headache	Cases	Side Effects	Complete Relief of Symptoms	Partial Relief of Severity and Duration	Little or No Relief of Symptoms
Migraine	34	6	9	16	9
Histaminic Cephalgia	10	5	2	6	2
Tension	6	3	1	3	2
Total	50	14	12	25	13

Table 1 shows that there was a considerable increase in the gastric upset in each type of headache when E.C.-112 was used in comparison to the results obtained in a recent report on Cafergot[7] and E.C.B.-210.[3] It is also of value to note that the results obtained with E.C.-112 were not nearly as good as those obtained with Cafergot in aborting headache attacks. Many of these patients who were given E.C.-112 and who experienced the gastric upset and did not obtain relief in aborting their headache attacks were then given Cafergot. The results were much better when Cafergot was used.

Table 2. **Results of Administration of E.C.-222 in Cases of Headache**

Type of Headache	Cases	Side Effects	Complete Relief of Symptoms	Partial Relief of Severity and Duration	Little or No Relief of Symptoms
Migraine	34	6	17	12	5
Histaminic Cephalgia	10	5	3	5	2
Tension	6	5	2	2	2
Total	50	16	22	19	9

Table 2 shows little difference between the results reported in table 1 in which E.C.-112 was used and those obtained with E.C.-222 as far as the side effects are concerned. The side effects were slightly greater than those produced by E.C.-112 but the results with the headache were better with E.C.-222. Both of these products seem to produce greater side effects than either Cafergot or E.C.B.-210 and neither seems as effective in aborting the headache attack.

Table 3 shows a decided decrease in the side effects as compared with E.C.-112 and E.C.-222. This perhaps is due to the fact that E.C.B.-115 contains Bellafoline whereas the other two suppositories do not. The ability of this suppository to abort the headache attacks is much greater than E.C.-112

Table 3. Results of Administration of E.C.B.-115 in Cases of Headache

Type of Headache	Cases	Side Effects	Complete Relief of Symptoms	Partial Relief of Severity and Duration	Little or No Relief of Symptoms
Migraine	34	4	18	10	6
Histaminic Cephalgia	10	2	6	3	1
Tension	6	2	2	2	2
Total	50	8	26	15	9

and about the same as or a little better than E.C.-222.

With the fourth suppository (table 4) one finds fewer side effects than with any of the previous ones. Its ability to abort the headache attacks is about the same as with E.C.-222.

These preparations all have some effect in aborting the headache attacks, the most effective being E.C.B.-115 and the least effective being E.C.-112.

Table 4. Results of Administration of DHEC#1 in Cases of Headache

Type of Headache	Cases	Side Effects	Complete Relief of Symptoms	Partial Relief of Severity and Duration	Little or No Relief of Symptoms
Migraine	34	2	8	18	8
Histaminic Cephalgia	10	2	4	4	2
Tension	6	2	1	1	4
Total	50	6	13	23	14

They all produce as much, or more, gastric side effects as the oral preparations. As many patients express it "They certainly help in relieving the headache but the stomach cramps are terrific." The side effects complained of stress this cramping more than the nausea. With the oral preparation the opposite was true.

From the results reported in this paper and those reported in other papers dealing with the headache problem it is evident that there are still many cases of failure with any drugs used to combat the headache attack. It is my opinion that the tension element is the stumbling block which causes these failures. The cases in this report are divided into migraine, histaminic cephalgia and tension types of headache. However, if a true breakdown of the migraine cases is made, a majority of them would be found to consist of a combination of migraine and tension. By this I mean that a majority of the migraine cases have an element of tension involved. It is this tension element which is responsible for the many failures in these cases. In the tension type of headache, it is apparent that the preparations discussed are far less successful than in either the migraine or the histaminic cephalgia type. Another point of interest is that the histaminic cephalgia type of headache seems to receive more benefit from the preparations than does the migraine group. This again may possibly be due to the fact that the tension element is more pronounced in the migraine type of headache than it is in the histaminic cephalgia type. Therefore, in the majority of cases of migraine headache, one should look for some element of tension.

From the results obtained with the four new preparations discussed, it seems that the relief of the headache attacks is certainly no better than with the oral preparation and in most cases it is not as good. The preparation, E.C.B.-115, produced as good results as the oral preparation but no better. The other three preparations were not quite as successful in aborting the headache attacks as Cafergot or E.C.B.-210.

E.C.B.-115 and DHEC#1 produce far less side effect than E.C.-112 and E.C.-222. They each produce about the same percentage of side effect as did Cafergot.[8] However, the E.C.B.-210 tablet produced less side effect than any of the suppositories. This is based on a comparison of the figures in this paper with those reported in a previous paper on E.C.B.-210.[3]

This is a preliminary report and further study must be made on these preparations; however, it seems logical that from the combination of drugs used in these suppositories that one combination has been omitted. That combination would consist of a suppository which would be the equivalent of two tablets of E.C.B.-210. This could be done by either doubling the amount of caffein in E.C.B.-115 or by adding 0.25 mg. of Bellafoline to the E.C.-222 which represents two tablets of Cafergot as is now prepared. There is no question but that the Bellafoline helps relieve the side effects and since E.C.B.-210 has been found to have an ideal dosage of two tablets at the immediate onset of the attack, one might use such a preparation in suppository form. Perhaps in the near future this will be done and perhaps through such efforts as the manufacturers of these preparations are making, the ideal formula may be found.

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Postgraduate Review

BLOOD AND BLOOD DERIVATIVES

ROBERT D. LANGE, M.D.
ST. LOUIS

THE ESTABLISHMENT of hospital blood banks, statewide blood banks and regional blood programs by the American Red Cross has led to a great increase in the use of blood for transfusions. Since some of the inherent dangers associated with blood transfusions are not well known, it is the purpose of this paper to review these dangers together with some of the newer developments in the field of blood and blood derivatives.

The review is divided into six divisions:

I. Transfusion Reactions.

II. Transmission of Disease by Blood and Its Derivatives.

III. Blood Group Systems. A. Description of the Individual Systems. B. Practical Considerations.

IV. Technics of Blood Preservation and Transfusion.

V. Blood Derivatives. A. Concentrated Red Cells. B. Plasma. C. Plasma Proteins.

VI. Summary.

Several recent publications have covered aspects of this field thoroughly. Readers are referred to them to supplement the information covered by this review.[1-8]

I. TRANSFUSION REACTIONS

Fatal reactions have been reported to occur in 0.14 per cent of all transfusions.[9] With the added danger of deaths and hepatic damage caused by homologous serum jaundice, it becomes a definite responsibility of each physician to weigh carefully the possible benefits to be derived from a blood transfusion against the statistical chance of a severe reaction. It, also, demands that the highest standards be maintained in the laboratory technics designed to safeguard the procedure.

The incidence of reactions following homologous blood transfusion has been reported as 3.4 per cent and 5.5 per cent in two large series.[10, 11] It has not been possible to reduce the incidence much below this because of uncontrolable factors and the element of human error. The types of reactions and their incidence in these two series is summarized in table 1. Fortunately most reactions are mild in character.

The pathogenesis, treatment and methods of prevention of the pyrogenic, allergic, hemolytic and circulatory reactions will be considered in this section. The problem of the transmission of homologous serum jaundice will be considered in the following section.

Pyrogenic reactions characterized by chills and fever are the most common complication of blood and plasma transfusions. The pyrogens are considered to be products of bacteria. These bacteria can multiply in the distilled water which is used to clean transfusion equipment.[12] The reactions may occur either during the transfusion or as long as twenty-four hours later. They may consist only of a chilly sensation but can be quite severe with temperature elevations of up to 104 F. The reactions are usually not serious unless they occur in a severely ill patient. If the reaction occurs while the blood is still being given, the transfusion should be discontinued and symptomatic treatment with aspirin or morphine administered. Calcium gluconate intravenously may stop the chill.[1]

Table 1. *Types of Reactions.*

Type of Reaction	DeGowin's Series of 5,386 Transfusions Per Cent	Klendshoj's Series of 5,969 Transfusions Per Cent
Pyrogenic	1.8	3.92
Allergic	.8	1.37
Hemolytic	.2	.18
Circulatory	.1	.05
Jaundice	.1	
Gastrointestinal	.2	
Other types		.03

Pyrogenic reactions can be greatly reduced in incidence either by using pyrogen free expendable transfusion equipment or by observing rigid precautions in the preparation and sterilization of reusable equipment. The careful preparation of pyrogen free distilled water is necessary if reusable equipment is employed.

Allergic reactions manifested by hives and occasionally by angioneurotic edema form the second most common type of reaction following blood transfusions. In most cases the etiologic agent cannot be determined. The symptoms usually occur during or immediately after the transfusion and unless angioneurotic edema is present are not of serious import. Treatment consists of small and adequate doses of epinephrine. Antihistamine preparations are also being used to treat this type of reaction. Prevention is difficult. However, individuals with acute allergic manifestations probably should not be used as blood donors and donors should observe a four hour fasting period before donating their blood.

Cardiovascular reactions from circulatory overload are probably the most common cause of death from blood transfusion when proper methods are employed to prevent incompatibilities.[1] This type of reaction is manifested by sudden dyspnea, orthopnea and cyanosis. The clinical signs of pulmonary edema can be elicited and the venous pressure is found to be elevated. Treatment should be carried out by phlebotomy or by applying tourniquets to the extremities to cut down the return flow of blood to the heart. This has been shown to pool about 15 per cent of the blood volume in the extremities.[13]

Circulatory overload is prone to occur in pa-

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tients with low cardiac reserve. It is, also, a source of danger in severely anemic patients, who, also, have been shown to have a lowered cardiac reserve.[14] Although blood usually can be safely administered at a rate of 20 cc. per minute, it has been recommended that in cardiac and severely anemic patients the rate should not exceed 1 cc. per pound of body weight per hour.[14] A careful watch should be kept for dyspnea, rales or cough. When blood is given to patients with lowered cardiac reserve, a venous pressure set should preferably be assembled so that frequent determinations can be made during the transfusion and thus prevent the complications before they occur.

Hemolytic reactions are the most frequent cause of death following blood transfusions. These reactions usually can be avoided by the proper storage of blood and the careful performance of compatibility tests. It is generally agreed that these reactions are caused by the liberation of free hemoglobin into the circulation which ultimately results in blockage of the renal tubules with casts of hemoglobin.[15] Renal ischemia also may occur.[16] In addition, Digilio and Hochwal have found wide spread visceral edema in two patients dying as a result of incompatible blood transfusions.[17] Hemolytic reactions are manifested usually by symptoms of lumbar pain, restlessness, chills and fever, nausea, vomiting, precordial pain and in severe cases, by shock. Ultimately jaundice, oliguria and oligemia may develop. Treatment of these reactions is difficult. The transfusion should be discontinued immediately. Alkalinization of the urine has been advocated since some reports have indicated that the hemoglobin casts do not form in an alkaline medium.[15, 18] Other reports have indicated that this is of doubtful value. Flink has observed equal amounts of renal damage in the presence of acid and alkaline urine, after the intravenous injection of hemoglobin solutions in dogs,[19] Compatible blood transfusions have been used as a supportive measure. Experience has indicated that fluid replacement calculated on the patient's actual fluid loss should be employed rather than forcing fluids.[1] Readers are referred to Strauss' excellent paper on the therapy of lower nephron syndrome.[30]

The causes of hemolysis have been divided by DeGowin into intravascular and extravascular mechanisms.[1] Extravascular hemolysis can be caused by the improper storage of blood or the addition of hypotonic or hypertonic solutions to the blood. It has been shown that if blood is warmed following refrigeration, even if subsequently refrigerated, deterioration proceeds at a rapid rate.[20, 21] There is, also, a poor post-transfusion survival of the cells. As a safeguard, a careful check with a recording thermometer should be made when blood is stored. A temperature of 4 C. is recommended at the present time.

Intravascular hemolysis can be caused by an increased osmotic fragility of donor's cells. However, the usual cause is the presence of incompatible hemolysins and isohemagglutinins in the recipient's plasma or the transfusion of incompatible agglutinins in the donor's serum. The former is the cause of reactions when blood of an incompatible group is transfused, or when Rh positive blood is given to a sensitized Rh negative individual. The transfusion of incompatible agglutinins in the donor's serum is caused by the use of Group O blood for transfusion of recipients of another blood group, or the transfusion of Group AB recipients with blood from another group. Using Group O blood as a universal blood group has been found to be a dangerous procedure and should be used only in extreme emergencies.[22] The recipient cells have been found to be involved in the reaction and can be destroyed at alarming rates.[23-27] Fatalities have occurred by using Group O blood for transfusion into individuals of other groups.[22]

If this type of reaction is to be avoided it is absolutely necessary that the Rh type of the donor and the recipient be determined and that a major and minor cross match be performed before any transfusion is given.

Dameshek and Neber recently described reactions in eleven patients probably due to a heat labile constituent of normal plasma.[28] They described a diagnostic test (the plasma provocative test) which can be used to determine if the reactions are caused by plasma. Their patients were benefited by transfusion of washed red cells.

A frequent misconception is that blood should not be administered until it has been allowed to reach room temperature. DeGowin et al. have shown that blood taken directly from the refrigerator at 5 C. has a temperature of from 15 to 25 C. when it reaches the vein.[29] Under these conditions there was no lowering of the body temperature, no consistent changes in the blood pressure and there were no untoward clinical symptoms.

Human errors play an important role as a cause of transfusion reactions. In some instances laboratory errors have been made. In other instances recipients have been given blood which had, in reality, been cross matched for another individual. Especially in operating rooms, it would seem to be a good procedure to have some individual orally check the patient's name and review the cross matching procedures before the blood is transfused. It is more difficult to detect reactions early in an anesthetized patient and consequently the most rigid precautions must be maintained in order to insure that the recipient is receiving the blood intended for him and which had been found to be compatible with his blood.

II. TRANSMISSION OF DISEASE BY BLOOD AND ITS DERIVATIVES

The three diseases most frequently transmitted by transfusion of blood or its derivatives are syphilis, malaria and homologous serum jaundice. Smallpox, measles, typhus, relapsing fever and influenza have been reported following transfusion, but their transmission in this country is a rare occurrence.[31-34]

Syphilis may be transmitted during the time the spirochete is in the blood stream. Standard serologic tests should, of course, be done on each unit of blood before transfusion and those showing a positive reaction discarded. Even this precaution will not prevent transmission of syphilis during a seronegative phase. It has been demonstrated, however, that blood stored for four days at 4 C. probably is no longer infective.[35]

Malaria, especially that caused by Plasmodium vivax, has been transmitted by blood transfusion.[36-39] It is the present practice to reject all donors with a history of malaria if the blood is to be used for a whole blood transfusion. However, in contrast to whole blood, Lozner et al. concluded, on the basis of their studies, that the likelihood of transmission of malaria by any plasma program, regardless of type of preservation used, is practically nonexistent.[40]

The problem of the transmission of homologous serum hepatitis following transfusion of blood or its products forms another real danger to the life of the recipient. Neefe lists the incidence of hepatitis following whole blood transfusions as from .6 per cent to .8 per cent.[7] The danger rises as plasma pools are used. Following the use of small plasma pools the incidence is estimated at about 1.50 per cent and after the use of large plasma pools the incidence is from 4.5 to 12 per cent.[7, 1, 41, 42] The mortality rate of patients, following an attack of homologous serum hepatitis is probably about 2 to 3 per cent.[43]

That a virus is the etiologic agent seems incontestable since material has been found to be infective following the passage through Seitz, Berkfeld, Chamberlin and other bacteria retaining filters. The virus is extremely resistant, surviving heat at 56 C. for from 30 to 60 minutes and remaining active in frozen and desiccated material for years. It is, also, resistant to chlorine, tricresol and merthiolate in concentrations that can be used with blood or derivatives. Although the viruses of serum hepatitis and infectious hepatitis are seemingly closely related, there are clinical and immunologic differences as recorded in table 2 adapted from Neefe.[7, 44]

The principle source of the virus is blood or its products and although usually transmitted by parenteral injection, cases have been recorded following the oral introduction or local application of blood or its products.[7] It has, also, been transmitted by inadequately sterilized syringes, needles, lancets or other instruments used for injections, venipunctures or skin punctures.[45]

Table 2 *Clinical and Immunologic Differences of Viruses SH and IH.*

A. Clinical Differences:

	Type of Onset	Constitutional Symptoms with Onset	Fever with Onset	Laboratory evidence of Hepatic Injury with Clinical Onset	Incubation Period
Infectious Hepatitis	Abrupt	Marked	Present	Delayed 2-7 days	17-37 days
Serum Hepatitis	Insidious	Minimal	Usually Absent	Often Present Before Onset	6 weeks to 6 months

B. Immunologic Differences:

	Incidence in Volunteers Following Oral Inoculation	Incidence follow. Parenteral Injection	Presence of Agent in Feces	Resistance to Infection after Previous Infection with Infectious Hepatitis	Resistance to Infection after Previous Infection with Serum Hepatitis	Passive Immunity Established by Gamma Globulin	Increasing Immunity with Age
Infectious Hepatitis	High	Low	+	+	-	+	+
Serum Hepatitis	O	High	-	-	+	-	-

There are several factors which make the prevention of homologous serum jaundice difficult. Some of these factors have been pointed out recently by Neefe.[7, 45] It has been shown that as little as .01 ml. of plasma has induced the disease in volunteers.[43] Hepatitis may be present without associated clinical symptoms or signs and Malmut recently demonstrated that the viremia can persist after recovery.[46] There is at present no practical method for demonstrating the presence of the virus in blood or its products. Further, there has been no successful transmission to species other than man, and active or passive immunization has not been established.[45]

Three methods are at present being used to prevent the transmission of serum hepatitis: (a) by reducing the size of plasma pools and adequate steam sterilization of needles, lancets and syringes; (b) by careful screening of potential donors for a history of jaundice or contact with jaundiced individuals, and utilization of tests which may indicate hepatic dysfunction; (c) by sterilization of the products. Serum albumin heated for ten hours at 60 C. has not been followed by hepatitis when injected.[47] Ultraviolet irradiation has been found successful in sterilizing icterogenic yellow fever vac-

cine and plasma.[47-51] Irradiation appears to be the most practical way of sterilizing plasma to at least reduce the incidence of serum hepatitis. It is not practical to irradiate whole blood since the blood viscosity is too great to allow rapid flow through the present quartz cells.[48] Blood also absorbs ultraviolet light so readily that thinner films would be required than it is possible to make at the present time. Chemical sterilization by nitrogen mustards is being investigated at the present time by Mangun and Hartman.[53]

III. BLOOD GROUP SYSTEMS

A. Description of Systems.—The human blood group systems are named for specific antigens present in the erythrocytes. These antigens are called agglutinogens. Antibodies, called isoagglutinins, present in the serum, are either naturally occurring or immune in origin. At the present time there

Table 3. *The ABO System.*

Blood Group or Subgroup	Frequency (Percent)	Isoagglutinins Usually Present	Isoagglutinins Occasionally Present
A_1	30.11	Anti B	Anti O
A_2	10.89	Anti B	Anti A_1
A_1B	2.94		Anti O
A_2B	1.06		Anti A_1
B	10.00	Anti A	Anti O
O	45.00	Anti A+ Anti B	

are seven known systems of blood groups. Using these systems it is theoretically possible to identify more than 100,000,000 genotypes.[6] It becomes apparent that an individual's composite blood group may be as specific as his finger prints, as Landsteiner originally predicted.

A knowledge of the blood groups is necessary to deal with problems arising in the use of blood. The seven known systems will be reviewed briefly. Readers are referred to Diamond's recent summary if a more extensive review of this field is desired.[6]

1. ABO System.—The discovery of the A and B antigens by Landsteiner in 1900 made blood transfusion a relatively safe procedure.[54] Six groups or subgroups are recognized in this system: A_1, A_2, A_1B, A_2B, B and O. Naturally occurring isoagglutinins are present and in 30 per cent of instances are accompanied by isohemolysins. Occasionally an individual of subgroup A_2 or A_2B will have antibodies which will agglutinate A_1 cells.[1, 6] An anti O antibody has been described in the serum of individuals belonging to Group A_1 or A_1B.[1, 6] Table 3 summarizes some of available data on the ABO system.

2. CDE (Rh) System.—The discovery of the CDE system by Landsteiner and Weiner in 1940 led to increased interest in the blood groups, explained one of the causes of intragroup transfusion reactions and, of course, helped clarify the pathogenesis of erythroblastosis fetalis.[55] Recently, in this journal, Hamilton and Brockland answered some of the frequent questions asked about this system.[56]

There are six antigens commonly associated with this system in various combinations: C (Rh′), D (Rh_0), E (Rh″), c (Hr′), d (Hr°) and e (Hr″). Two variants have been observed as related antigens, i.e., C^w and D^u.[63, 64] If any of the antigens C, D or E are present in the cells, the individual is considered to be positive for that factor. In a truly Rh negative individual, none of the factors C, D or E would be present. The antigenicity of these factors varies. The D factor is a potent antigen while C, E, c, d, e are much weaker in their action.[6] Because of this, cells which do not contain the D factor are sometimes considered to be Rh negative, even though they may contain C or E.

There are no naturally occurring antibodies to these antigens. The antibodies occur only as the result of immunization by transfusion or pregnancy. Diamond has emphasized the fact that 95 per cent of D (Rh_0) negative women with D (Rh_0) positive husbands are never immunized to D and their infants will not have erythroblastosis. In contrast, it has been shown that more than 50 per cent of the D negative individuals receiving D positive blood transfusions can be sensitized.[57] Once sensitization has occurred, the transfusion of D positive blood could be fatal and women with Rh positive husbands may not be able to give birth to nonerythroblastotic children.

3. MNS System.—The antigen M was described in 1927 by Landsteiner and Levine.[58] A later report described the antigen N, and only recently has the antigent S been found to be linked to the MN antigens.[59, 60] All individuals are either M, N, or MN and each is either S positive or S negative. Antibodies to these antigens have rarely been reported but can be either natural or immune.

4. P System.—The antigen P was described at the same time as N.[59] The population is 71.4 per cent P positive and 28.6 per cent P negative.[6] Although naturally occurring and immune anti P antibodies have been found, the P antigen has almost no clinical significance.

5. The Le (Lewis) System.—The Le^a antigen was discovered in 1946.[61] Agglutinins were found in the sera of two women. These sera agglutinated bloods of from 24 to 25 per cent of the bloods drawn from English people. Andreasen later described the antigen Le^b which is present in the absence of Le^a.[62] Thus far, no clinical problems have arisen concerning the Le system.

6. The K (Kell-Cellano) System.—Coombs and Mourant in their paper describing the direct "Coombs" test also described an antigen and its homologous antibody of a type previously unknown.[65] This became known as the Kell antigen and it was found that about 11 per cent of the English population is Kell positive. Recently Levine described a new antibody as an allele of the Kell factor and named this anti Cellano.[66] Hyperimmune antibodies have been described and therefore this antigen may be found to have some clinical importance.[6]

7. The Lu (Luthern) System.—In 1945 Callander,

Race and Paykoc described the appearance of previously unknown antibodies in the recipient of blood transfusions.[67] This was called anti Luthern and agglutinated blood cells in from 8 to 9 per cent of the English population. Other examples of human immunization have been reported. At the present time, no clinical problems associated with this system have been reported.[68] The available evidence, however, suggests that this factor is moderately antigenic and should be considered when transfusion reactions are investigated.

B. Practical Considerations.—From a practical standpoint only two of these systems, the ABO and CDE, need to be considered in the transfusion of blood; the ABO because of the occurrence of natural agglutinins and the CDE because of the problem of immunization to those antigens. Before any transfusion is given the ABO blood group and the Rh type of both the donor and the recipient should be determined. A major and minor cross match should be performed if fatal hemolytic reactions are to be avoided. It should be remembered that if an Rh negative individual or a C or E positive individual is given D positive blood, sensitization may occur. It is, also, possible to sensitize a D negative individual to C or E but this is a seemingly rare occurrence. DeGowin has stated "It is increasingly apparent that it is an irresponsible act to transfuse an Rh negative patient with Rh positive blood except in an emergency."[1]

IV. TECHNICS OF BLOOD PRESERVATION AND TRANSFUSION

With the introduction of sodium citrate as an anticoagulant, it became possible to store blood for at least five days.[69-71] Although the value of dextrose in a preservative solution was recognized during the first World War, it was not until World War II that a practical and small volume preservative solution (ACD) was developed.[72-75] With the addition of dextrose and citric acid to the citrate solution, it was shown that blood could be used safely for from twenty-one to thirty days, if adequate refrigeration was maintained.[76-77] By use of the differential agglutination technic of Ashby, it has also been shown that when blood is collected in ACD solution and stored for two weeks, the erythrocytes survive in the circulation of the recipient for a period of time which is 92 per cent of the expected survival time of fresh whole blood.[78] Figure 1 shows the post-transfusion survival of blood stored for different periods of time after preservation in a neutral citrate glucose solution. Normally red blood cells survive an average of 120 days as demonstrated by technics of differential agglutination, radio active iron, and glycine labeled with N^{15}.[79-81]

While the present methods of preservation are moderately suitable for red cell preservation they are inadequate for the preservation of white blood cells or platelets.[82, 83] Due to these technical difficulties and because the circulatory life span of the leukocytes and platelets is so short, it becomes almost impossible to transfuse these formed elements successfully.

One of the newer developments in the use of blood has been the use of replacement transfusions for erythroblastosis fetalis. Wallerstein described this technic in 1946.[84] Since that time several reports have appeared describing improvements in technic.[85-87]

The rational for using this method of treatment is the replacement of the infant's Rh positive cells with Rh negative cells which would not be affected by the antibody present in the circulation. By using

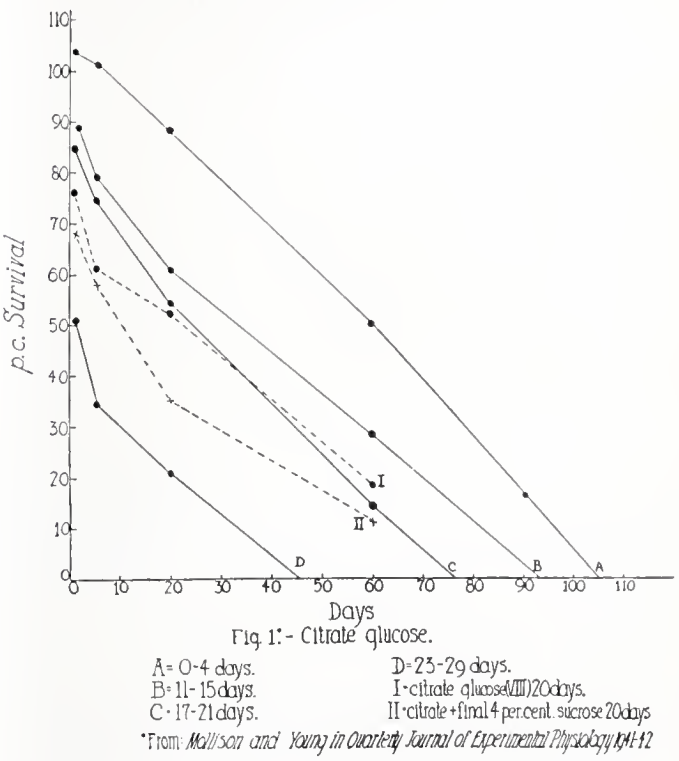


Fig. 1.- Citrate glucose.

A = 0-4 days.
B = 11-15 days.
C = 17-21 days.
D = 23-29 days.
I = citrate glucose(VIII) 20 days.
II = citrate + final 4 per cent. sucrose 20 days

*From: Mollison and Young in Quarterly Journal of Experimental Physiology 1941-42

Fig. 1.

500 cc. of blood, one can replace approximately 85 per cent of the original cells.[84] Diamond in 1948 described a method of accomplishing the transfusion through the umbilical vein, utilizing a bland polythene plastic catheter.[88] In the same article Diamond listed the clinical and laboratory evidence of erythroblastosis which should be present before an exchange transfusion is performed. The following two criteria were listed: (1) the presence of maternal antibodies together with the clinical signs of erythroblastosis or (2) the presence of coated erythrocytes and free antibody in the circulation of a definitely Rh positive baby.

Mollison has used the hemoglobin value of cord blood in infants with hemolytic disease as a criteria for severity and a help in deciding whether or not treatment is needed.[89] He found that infants whose cord blood contained less than 8 gm. per cent hemoglobin were likely to die within twenty-four hours of birth and that infants with values of more than 14.5 gm. per cent were quite likely to recover without treatment.

Recently Allen and Diamond presented statistical evidence that blood taken from female donors was

of great value in treating erythroblastotic infants.[90] They found that of 137 infants receiving blood from male donors only, twenty-seven died. Of forty-two receiving blood from female donors only, none died. The beneficial component present in the blood of women donors is not known.

In spite of the apparently good results obtained with exchange transfusions, Rosenblatt has reported finding necrotic lesions in the livers and adrenal glands in infants who died following the procedure.[91] These lesions were attributed to the transfusions. Pennell has described a method of treating these patients by transfusion of from 50 to 60 cc. of compatible sedimented red cells to avoid the administration of excess adult plasma.[92] It is thought that further hemolysis of the infants red cells by enhancing the agglutinin titer would thus be prevented.

Frequently questions are asked concerning the amount of blood which should be transfused and what hemoglobin level should be attained under different pathologic conditions. One of the formulas for calculating the amount of blood to transfuse was developed by Marriott.[14] His formula was as follows: The amount of blood to be transfused = $\frac{\text{per cent of Rise of Hemoglobin required}}{100} \times$ patient's normal blood volume in cc. The patient's normal blood volume is 40 cu. mm. per pound of body weight. A simpler method is to allow a pint of blood for each 10 per cent of hemoglobin rise required. Five hundred cc. of blood can be expected to produce a rise of approximately a half million red cells per cu. mm., which is equivalent to 1.5 gm. of hemoglobin per 100 cu. mm. in the average adult.[14] Although these calculations are not usually performed, they will give an estimate on the amount of blood required to reach the desired level of hemoglobin.

Hardin has recommended the attainment of the following blood levels in the treatment of anemias.[1]

(1) Preparation for operation 4.00 million red blood cells per cu. mm. with 12 gm. per cent hemoglobin.

(2) In aplastic anemia 3.5 million red blood cells with 10.5 gm. per cent hemoglobin.

(3) In infections 5.00 million red blood cells with 15.0 gm. per cent hemoglobin.

(4) In dangerously low anemias 2.25 million red blood cells and 6.75 gm. per cent hemoglobin.

V. BLOOD DERIVATIVES

The use of specific components of blood to correct a specific deficiency forms a new concept in the field of transfusion practices.[93] Although the use of plasma and red cell suspensions was described previously, they were not widely utilized until the recent World War. The fractionation of plasma into its various proteins was stimulated by the search for a stable, easily transported plasma substitute. The possible benefits are only beginning to be realized since long term investigations are needed before the therapeutic place of the plasma proteins is realized. Not only are these proteins important therapeutically, but also as tools in the physiologic investigations of their functions.

Table 4.** *Effect of Fractionation on Utilization of Twenty Blood Donations.*

Derivative	Dating Period	Clinical Use	Number Packages	Number Patients Treated	Total
Whole Blood	21 days	Hemorrhage	20	20	20
		Separation of Cells and Plasma			
Red Cells	21 days	Anemia	20	20	
Dried plasma	5 yr.	Shock, hypoproteinemia	10	10	30
		Fractionation of Blood			
Red Cells	21 days	Anemia	20	20	
Fraction I	1 yr.	Hemophilia, surgery	30*	30	
Gamma globulin	3 yr.	Prophylaxis of infections	80	80	135
Serum albumin	5 yr.	Shock, hypoproteinemia	5	5	
Isohemagglutinins†	1 yr.	Blood grouping	100	2,000	
Thrombin†	1 yr.	Hemostasis	150	150	2,150
Other Fractions	....	Further research	....	....	

* Alternatives: Fibrin foan or Fibrin film.
† Yield of these products is so large that they need be produced only from occasional runs.
** Janeway, J. A. M. A. 1948.

This section will be subdivided into three parts: The use of (A) concentrated red cells, (B) plasma and (C) the plasma proteins.

A. The Use of Concentrated Red Cells.—The transfusion of the red cells remaining after removal of most of the plasma has been found to be a safe, practical, economical and valuable procedure.[94-98] It is a procedure which should be more widely used. The use of these cells has a great advantage in the treatment of anemias not due to blood loss or infection in that they supply more hemoglobin with less osmotic activity of the plasma proteins and with less sodium than a corresponding amount of whole blood.[99] The dose of red cells that can be given is therefore increased without overloading the circulation. As previously mentioned this is of prime importance in cardiac and severely anemic patients.[98-100] Secondly, the plasma, which is not needed, is saved for other pur-

poses, i.e., fractionation into the plasma proteins. Table 4 shows what can be derived from the fractionation of twenty blood donations together with the normal dating period of each component.[99]

It has been estimated that from 25 to 50 per cent of the transfusions given in a general hospital are given to correct anemia and could be administered as concentrated red cells.[100, 101] The red cells have been found to have a satisfactory survival during the normal outdating period of the whole blood and to cause the expected rise in hemoglobin.[77, 97, 102] Evans has pointed out that the 5 per cent of plasma remaining with the cellular portion of the blood is sufficient for an uninterrupted flow. If the reservoir is placed three feet above the antecubital space, 250 cc. of concentrated cells can be administered in forty minutes through an 18 gauge needle.[100] If saline is added, the infusion should be started immediately for a greatly reduced post-transfusion survival of the cells has been noted if the cells are in contact with the saline solution for more than a few hours.[103] It is obvious that cross matching procedures must be done before the administration of concentrated red cells.[98]

B. Plasma.—The therapeutic use of plasma has greatly decreased due probably to two factors: first, the increased availability of whole blood which provides oxygen carrying capacity as well as antishock properties; second, the full realization of the occurrence of serum homologous hepatitis following the use of plasma has greatly limited its use.

When ultraviolet irradiated plasma is more generally available, plasma should once more find a place in therapeutic regimens.

The antishock properties have never been doubted and even in hemorrhagic shock it is valuable in maintaining the blood pressure until whole blood transfusions are instituted.[5]

Table 5. *Use of Plasma in Burns.*

Region Involved	Per Cent of Total Surface
Head	6
Trunk	38
Anterior surface	20
Posterior surface	18
Upper Extremities	18
Arms and Forearms	13.5
Hands	4.5
Lower Extremities	38
Thighs	19
Legs	13
Feet	6

* Berkow, Am. J. Surgery, 1931.

Plasma has long been recommended in the treatment of burn shock. The dosages which have been recommended have followed two general patterns. Harkins advises the administration of 100 cc. of plasma for every point that the hemotocrit determination exceeds the normal of 45.[104] A second method utilizes the per cent of surface of the body burned. Berkow's values are given in table 5.[105]

About 50 to 100 cc. of plasma are administered for each per cent of the body surface burned.[106] Even if plasma is utilized in place of whole blood, it is frequently necessary to administer whole blood to prevent or correct the anemia which develops following a severe burn. Evans and Bigger recently advised the use of whole blood transfusions for the management of burn shock, even in the presence of marked hemoconcentration.[107] They have shown that a decrease in the circulating red cell mass is present in severely burned patients. Through the use of whole blood, anemia was regularly avoided.

Plasma, also, has been recommended for the treatment of medical shock such as occurs in Addison's

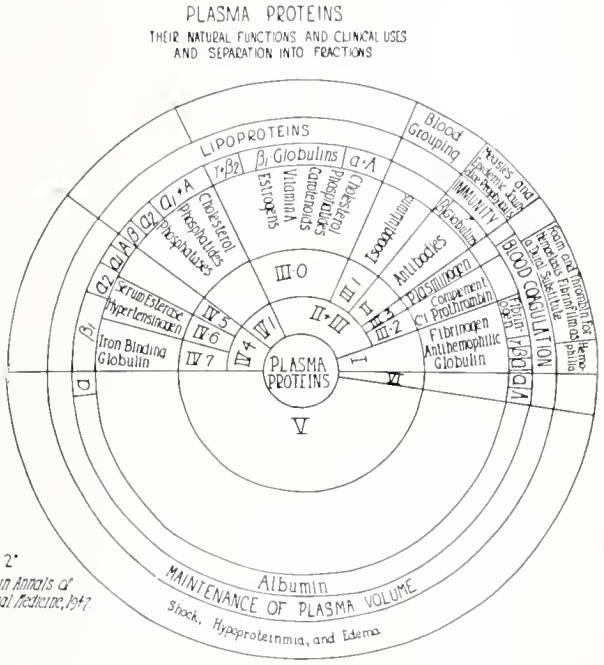


Fig. 2.

Fig. 2*

*From Cohn in Annals of Internal Medicine, 1947.

disease, diabetic coma and diarrhea in infants.

Plasma has been used in the past to transfer antibodies and correct acute and chronic hypoproteinemias.[2] Its use in these circumstances, as well as in the deficiencies of complement, prothrombin and antihemophilic substance[2] probably will be replaced by products of plasma fractionation, when they are generally available.

C. The Plasma Derivatives.—The separation of the plasma protein fractions by Cohn is one of the newer developments in transfusion practices. Although more than sixty fractions have been described, only a few of those isolated and purified sufficiently for clinical use have been found to be therapeutically effective. Only these will be discussed in this paper.

For the method of separation of the various plasma proteins into fractions, reference should be made to papers by Cohn et al.[8, 108-113] Six fractions have been described. The distribution of the plasma proteins in the various fractions and some of the clinical uses of these fractions are illustrated in figure 2.[112]

Fraction I contains largely fibrinogen and antihemophiliac globulin. The fibrinogin has been combined with thrombin of Fraction III to form fibrin films and foams.[111] The fibrin films have been found to be satisfactory in the repair of dural defects; there is little tissue reaction when they are left in

place.[115] They, also, have been used to form tubes for vein anastomosis.[116]

Fibrin foams have been prepared by Behring. These have found wide use in controlling the oozing from various operative sites.[114] The foam is an effective absorbable hemostatic agent in many different types of neurosurgical operations.[117] The foam, also, has proved of value on the cut surface of the liver and in controlling the oozing of the gallbladder bed in cholecystectomy.[118] The combination of fibrinogen and thrombin has controlled bleeding from tooth sockets of patients with hemophilia and has controlled nasal hemorrhages in leukemia patients.[118] Dees injected a solution of fibrinogen and thrombin around renal calculi to facilitate their removal.[119] The foam has been used as a bronchial plug following lobectomy and as a hemostatic agent in suprapubic prostatectomy.[120, 121] Cronkite et al. described the use of thrombin and fibrinogen in skin grafting.[122]

The fibrinogen from Fraction I has been used in the treatment of cases of congenital hypofibrinoginemia.[5]

A globulin has been isolated from normal plasma which will usually reduce the coagulation time of individuals with hemophilia.[123] It was isolated in Fraction I and is not fibrinogen.[124] By use of one unit of this antihemophiliac globulin equivalent to 0.2 gm. protein, the coagulation time of a hemophiliac can usually be brought to almost normal limits.[125] This maximum effect usually is maintained for about four hours, after which the coagulation time again begins to rise and the effect is usually gone within twenty-four hours. This temporary correction of the coagulation defect is, however, of immense importance in hemophiliac patients for it allows both emergency and elective surgical procedures to be carried out with more safety than was formerly possible.[125] One difficulty, which has arisen, has been the development in some patients of refractoriness to further injections of the globulin.[126] Also, serum hepatitis has been reported to occur after the injection of this globulin fraction. This globulin is extremely labile and fresh plasma is needed for fractionation if potent material is to be obtained.[124]

Fractions II and III are precipitated together.[109] Among the components present largely in these fractions are complement, thrombin, isohemagglutinins and immune serum globulin. The use of thrombin in combination with fibrin clots has been discussed in a previous section. Although complement has been isolated it has not been used clinically.

The isohemagglutinins obtained as products of the fractionation program have been found to be adequate for the determination of human blood groups.[127] Melin later described a method of preparation of the anti A isoagglutinin reagents from mixed blood of groups O and B.[128] This is a valuable procedure since Group B individuals comprise only 10 per cent of the population.

The immune serum globulin, prepared at present, concentrates up to twenty-five times most of the antibodies present in normal adult serum.[129] This makes it possible to give the equivalent of 125 cc. of pooled adult serum in one injection.[130]

Immune serum globulin has been found to be most effective in the modification or prevention of measles.[130-133] The dosage recommended at present for the modification of measles is from 3.0 to 3.7 mg. of gamma globulin per pound of body weight and preferably should be administered within the first six days of the incubation period. This corresponds to .025 cc. of gamma globulin per pound of body weight.[130] When complete protection is desired five times as much should be given early in the incubation period. Few reactions have been reported and these are minor in character.[130]

Two reports have indicated that gamma globulin may be effective in the prophylaxis of infectious hepatitis.[134, 135] Fifteen hundredths cc. per pound of body weight should be administered. In contrast to the probable benefit in infectious hepatitis gamma globulin is probably of no value in serum homologous jaundice.[136-137]

It, also, has been found to be ineffective in poliomyelitis.[138] No benefit was seen in a controlled series of 111 cases reported by Bahlke and Perkins.

In the treatment of mumps it has been shown that gamma globulin derived from mumps convalescent serum prevented orchitis in about two thirds of the patients who would have been expected to develop it.[139] Gamma globulin derived from normal human plasma was ineffective in preventing the orchitis.

Fraction V consists largely of serum albumin. While the albumin represents less than 60 per cent of the plasma proteins, it is responsible for approximately 80 per cent of the osmotic activity of blood. In addition it plays a role in the nutrition of the tissues. The albumin fraction was developed in order to obtain a blood substitute which could be distributed as a stable small volume solution ready for immediate use.[140] It was made available in 25 per cent solution which was no more viscous than blood. Each gram of albumin was found to be equivalent to 1.2 grams of plasma protein or 20 cc. of citrated pooled plasma.[141] Thus 25 grams of albumin were found to be equivalent to 500 cc. of plasma. Since albumin may be heated for ten hours at 60 C. without disturbing its functional capacity, the danger of transmission of serum homologous jaundice was overcome.[142] Repeated tests have shown that it can be administered safely with a minimum of reactions.

The use of albumin will be discussed under three headings: (a) the use in shock, (b) use in hypoproteinemias and (c) use in miscellaneous conditions.

Serum albumin was developed for emergency use in shock. It was predicted that about 18 cc. of fluid would be held in the blood stream for each gram of albumin injected.[141] Clinically, values from 12 to 18 cc. have been found.[143-145] The blood volume is therefore increased rapidly and there is a

concomitant hemodilution. Stead found that although there was a rise in right atrial pressure in normal subjects after the injection of albumin, the arterial pressure remained unchanged.[144] Other investigators have found a rise in the mean arterial blood pressure of 17 mm. Hg. in patients with oligemia and hypotension following the injection of albumin.[143] Stead concluded that serum albumin is a useful substitute for plasma in the emergency treatment of shock from any cause.[144] It cannot replace whole blood for it suffers from the same deficiency as plasma, i.e., lack of oxygen carrying capacity. However, because of its stability, ease of administration and low rate of reactions it undoubtedly will be found to be extremely useful in emergencies.[5]

The use of albumin in hypoproteinemias has not been well delineated and further investigation is needed before definite criteria for its employment can be made.

In general, there are three causes of hypoproteinemia: (A) due to an inadequate intake, (B) due to an altered ability to synthesize as in cirrhosis and (C) due to excessive protein loss as in nephrosis.[158] Most of the published reports deal with the use of albumin in cirrhosis and nephrosis.

In cirrhosis there have been some favorable reports on the use of albumin in advanced cases with ascites and fluid retention. Thorne et al., in a preliminary study, found increases in serum albumin levels following doses of 50 grams a day for from one to ten days.[146] They suggested that albumin was promising in severe cirrhotic patients who on dietary therapy could maintain nitrogen balance but who could not raise their serum albumin levels. Also, in long continued cirrhosis with anorexia it was thought to be promising. Kunkel et al. obtained beneficial results in six of seven patients with a nutritional type of cirrhosis.[147] They found that from four to eighty 25 gram units of albumin were needed to produce the effect. They further found that in those patients with definite evidence of portal obstruction, a high antidiuretic titer in the urine or long standing ascites proved resistant.

Other investigators have found no clinical change in their patients.[148] Falloon et al. thought that in twenty-nine patients given albumin over a period of from four days to eight months, that the albumin was not specific for the relief of ascites nor beneficial in the treatment in the underlying hepatic condition.[149] In three patients a fatal hemorrhage from esophageal varices occurred. They stated that the use of albumin in elderly patients, cardiac patients or in the presence of esophageal varices is dangerous and caution should be exercised. They, also, noticed pulmonary edema and pleural effusions as untoward effects.

Albumin has been found to be of value in the treatment of some cases of nephrosis.[150] In patients with edema, low serum proteins, absent to moderate hypertension and nitrogen retention, albumin was found to be a safe agent in increasing the serum albumin level.[151] It also induced nitrogen balance. Caution must be used because the increased blood volume may precipitate pulmonary edema. Although it is true that a diuresis has been instituted in some cases, there has been no evidence that it had an influence on the natural cause of the disease.[150-152] In order to obtain effects, it is usually necessary to administer large doses over a long period of time. Starting doses suggested are roughly 12.5 gm. daily for children less than 3 years, 25 grams daily in children aged 3 to 12 years and 50 grams daily in adolescents and adults. If such a dose is not effective in several days, it may be increased by 50 to 100 per cent and tried for several days more.[152]

Albumin may become most beneficial in acute hypoproteinemias and the treatment of acute edemas demanding rapid amelioration.[153] It has been employed in the treatment of the edema of erythroblastosis.[154] Albumin is an extremely useful tool in physiologic studies on edema.[153] It has, also, been found to bind fatty acids, metals and drugs such as penicillin and sulfonamide preparations.[113, 155-157]

It should be noted that some of the fractions mentioned in this paper are not generally available. It is hoped that through the expansion of the Red Cross blood programs and expansion of the private hospital blood banks, that enough blood will be available for transfusion purposes and also for plasma and plasma fractionation.

VI. SUMMARY

Some of the dangers associated with the transfusion of blood have been discussed together with the diseases transmissable by transfusion. The seven known blood groups were reviewed briefly. Some of the newer technics of blood preservation and transfusion were presented. In the final section the uses of several of the derivatives of blood were discussed.

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WAR EFFECT ON MEDICAL EDUCATION MEETING TOPIC

The impact of war on medical education in the United States will highlight the 47th annual Congress on Medical Education and Licensure at the Palmer House, Chicago, February 11-13.

The three day conference will be sponsored jointly by the Council on Medical Education and Hospitals of the American Medical Association and two related groups, the Advisory Board for Medical Specialties and the Federation of State Medical Boards of the United States.

"Information to be presented and discussions to take place at this meeting will have an important bearing on medical education in the present emergency," said Dr. Donald G. Anderson of Chicago, secretary of the council.

"More than 25,000 students are enrolled in the medical schools of the United States, an all time high. It is imperative that the government in formulating its policy on the mobilization of manpower for war give due weight to the continued education of these students and those to follow on the basis of the doctor needs of the Armed Services and the requirements of the civilian population.

"The problems growing out of the mobilization of this manpower must be, and can be, met without impairing the important and essential contribution which medical education is making to this country."

Selective Service, Armed Forces and medical school authorities in papers and panel discussions will consider these problems at a meeting of the Council on Medical Education and Hospitals, February 12. Before the same group that afternoon, Dr. H. G. Weiskotten of Syracuse, chairman of the council, will review the continuing evolution of the medical curriculum. A preliminary report on the first comprehensive survey of medical education in the last 16 years will be made.

The Advisory Board for Medical Specialties, meeting February 11, will present two round table discussions dealing with medical specialties.

The Federation of State Medical Boards of the United States will meet February 13. It will hear papers dealing with displaced physicians, the supply of doctors and the current campaign against medical quackery. A panel discussion will deal with technical problems of examinations for medical licenses.

NEW TEST GIVES WARNING OF BLEEDING TENDENCY

Hemophilia is not the rare, mysterious and uncommon disease people believe it is, a Milwaukee physician writes in the January 6 *Journal of the American Medical Association.*

Hemophiliac patients, said Dr. Armand J. Quick, of Marquette University School of Medicine and Milwaukee Children's Hospital, need not be left to the care of specialists but usually can be cared for by the family doctor. A new test—called prothrombin consumption test—is proving valuable to the doctor by warning him that a hemophiliac condition exists in certain patients.

"Although the diagnosis is generally easy when the condition is severe," said Dr. Quick, "difficulty is apt to be encountered when the bleeding tendency is not pronounced and the family history is negative for hemophilia."

"In a surprisingly large number of hemophiliacs," he continued, "no positive family history is obtainable."

He cited Queen Victoria as a notable example of a carrier but whose family history appears "entirely negative." It was pointed out that the defect can pass silently through several generations of women. It is also known that a male may have the disease in such a mild state that it may be considered "subclinical," and yet he will transmit the defect to his daughters. The severity of the disease in offspring is unpredictable.

According to Dr. Quick, abnormal bleeding after tooth extraction or a minor operation is sometimes the first sign, and in some cases the only sign, of a bleeding tendency.

"A considerable number of hemophiliacs," he continued, "have the disease in such a mild form that they rarely require medical treatment and even those who have moderately severe hemophilia may be free of hemorrhagic episodes for relatively long periods."

Bleeding into joints usually occurs for the first time after the child begins walking and engages in relatively strenuous games. Such a condition generally denotes "moderately severe" hemophilia, he said.

The application of cold, the use of a pressure bandage, if the site of the injury permits, and complete rest of the joint were named as three essentials for immediate treatment following injury.

Dr. Quick pointed out that contrary to popular belief the most important danger in hemophilia is not loss of blood but the development of various lesions caused by pressure of tumor masses and bleeding into the joints.

"Many hemophiliacs are crippled because joints were neglected after hemarthrosis or because contractions occurred after hemorrhage into a muscle," he said.

"Much of this problem is in the domain of the orthopedic surgeon, but if the parents of a hemophiliac child are properly educated and have the service of a family physician who handles the emergencies much can be accomplished in saving the hemophiliac case from becoming a cripple."

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Neurofibrosarcoma of the Breast

History.—(Presented by S. M. Rabson, M.D., St. Joseph Hospital, Ft. Wayne, Indiana). In 1942 this 42 year old white woman underwent removal of a lump of the breast which was diagnosed as "cystic disease of the breast; fibro-adenoma." In February 1948, following the surgeon's report that a recurrence was present, the slides from that specimen were reviewed. Giant cells and mitotic figures were seen, and it was suggested that a stromal neoplasm was probably present. The following month, March 1948, the recurrent mass was excised and a diagnosis made of "fibro-adenoma, inflamed." In November 1948 a second recurrence was excised; the sections are prepared from this tissue.

Otto Saphir, M.D., Chicago: This section (fig. 7) shows an invasive tumor composed of whorls and interlacing fasciculi of delicate wavy fibrils and numerous cells. One margin is surrounded by thick bands of fibrous tissue which extend into the tumor for a short distance. The cells are oval or polyhedral with a small amount of acidophilic cytoplasm and markedly pleomorphic nuclei. The latter are often slender, hyperchromatic and elongated, or large and oval. The chromatin is coarsely granular and there are one or two large nucleoli. Rare giant cells can be seen. Mitotic figures are frequent. A van Gieson stain reveals a paucity of fibrous tissue. There are minute foci of necrosis and scattered infiltrations of eosinophils, plasma cells and many lymphocytes.

Almost everybody calls this lesion either a fibrosarcoma or some sort of a sarcoma. I consider it not only a sarcoma but, more specifically, a neurofibrosarcoma. This is obviously a breast tumor consisting principally of mesenchymal structures, although epithelial structures are present occasionally. The differential diagnosis includes: (1) adenofibroma of the breast with proliferation of connective tissue structures; (2) adenosarcoma; (3) recurrent fibrosarcoma, and (4) neurofibrosarcoma. The outstanding characteristics are: an interlacing of fibers, palisading of nuclei and invasion. Cheatle and Cutler[1] believe that the most common type of mammary sarcoma is the so-called malignant transformation of connective tissue which is part of an adenofibroma and, hence, the term, adenosarcoma. They believe that a fibrosarcoma of the breast without epithelial elements is extremely rare.

Morphologic evidence that this is a malignant tumor includes invasiveness, anaplasia, a few atypical mitotic figures, a number of multinucleated cells and a paucity of glandular structures. Although these glandular structures may have been present, they were most likely invaded and eventually replaced by the tumor. This point is additional evidence of malignancy. I admit that there is no absolute proof to substantiate my diagnosis of a neurofibrosarcoma. However, in the van Gieson stain the stroma is either yellow nor red. There

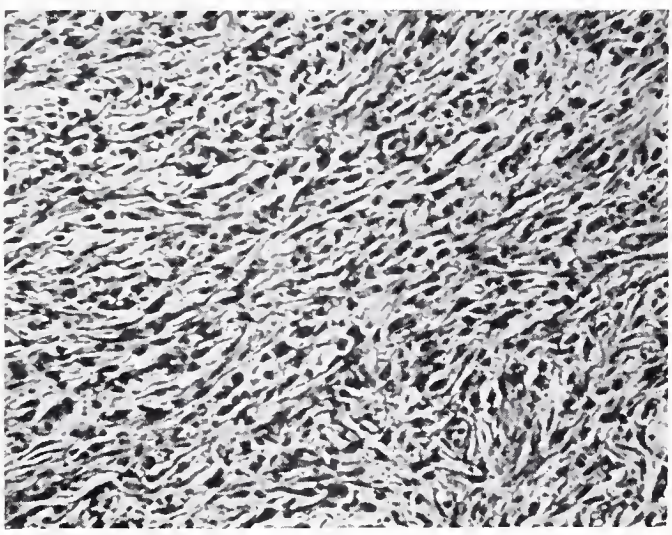


Fig. 7. Note the interlacing fibers, the many spindle-shaped nuclei, and the tendency toward papillary arrangement of groups of fibers.

is a tendency toward palisading and plexiform arrangement, which I consider characteristic of neurogenic origin.

Lauren V. Ackerman, M.D., St. Louis: I believe it is important in this tumor, regardless of its label, to indicate that it is of fairly low malignancy. Although local recurrences are frequent, distant metastases are infrequent. Wide radical excision probably will be curative. Now, I have difficulty in recognizing tumors of neurogenic origin on the basis of their microscopic pattern, or on the basis of invasion, because I think that fibrosarcomas also invade and recur locally. It is my feeling that neurogenic sarcomas are relatively rare tumors and that malignant changes in a neurofibroma are also rare occurrences.

Dr. Saphir: It is quite evident that we differ in opinion. I have made the diagnosis of fibrosarcoma only on rare occasions. As you stated, Dr. Ackerman, local recurrence is frequent in both the neurofibrosarcoma and the fibrosarcomas. In addition, whenever I call a tumor a neurofibrasarcoma, I always add a note stating that it will recur locally, if not completely removed, but will not produce metastases. In my experience such tumors become

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From the 1950 Tumor Seminar held at the Ellis Fischel State Cancer Hospital, Columbia, conducted by Otto Saphir, M.D., Chicago. The first portion appeared in the January issue of The Journal and the remainder will appear in a subsequent issue.

more cellular with repeated recurrences until, ultimately, they fall into the category of neurogenic sarcomas. In the latter metastases can occur.

Leo Lowbeer, M.D., Tulsa: Ten years ago I made a diagnosis of a low grade fibrosarcoma of the leg. Recently, I saw this patient again and there was no evidence of recurrence. Naturally, I questioned the validity of my diagnosis and reviewed the slides. In 1938, at the age of 24, this patient had been in an automobile accident and had suffered a severe bruise on the lateral aspect of the left thigh. A slowly growing tumor developed at the site of trauma. One year later the tumor was excised and a microscopic diagnosis of fibrosing myositis and fascial fibroma was made. Six postoperative x-ray treatments were given. During the next year the tumor recurred. The patient had lost twenty pounds of weight. This time, two years after the initial trauma, a thorough surgical exposure was performed. The entire semitendinous and one half of the semimembranous muscle were involved by a diffuse mass which was removed. Microscopically, in addition to the fibrosis and chronic inflammation of the muscles, there was an infiltrating neoplasm composed of fibroblastic cells which were comparatively few in number. They exhibited no anaplasia but produced an abundant fibrillar stroma which did not have the characteristics of collagen with special stains. I made a diagnosis of an infiltrating, low grade, fascial fibrosarcoma or neurofibrosarcoma on the basis of a post-traumatic fibrosing myositis. I added the same note which you did, Dr. Saphir, that this tumor would recur if not entirely removed, but that metastases would be unlikely. Ten years have elapsed since I made this diagnosis. After reviewing the slides with some trepidation I confirmed my previous diagnosis of ten years ago. There is no doubt but that there was a low grade fibrosarcoma and, despite the magnitude, the entire lesion has been excised.

Dr. Saphir: It is interesting that many of these tumors are found in the soft tissues of the lower extremities, such as you have experienced.

Louis A. Schneider, M.D., Ft. Wayne: We followed the patient, whose case is now under discussion, for several years. There is a mistake in the history, which I believe is our fault. The patient was seen in 1947 rather than in 1942. At that time there was a process which we felt was primary epithelial in nature, and a diagnosis of cystic disease was made. We thought that there were associated fibroadenomas. Six months later the surgeon reported that there was a recurrence which, incidentally, was in the upper outer quadrant of the breast. We experienced considerable difficulty in convincing him that it had originated in the breast. We reviewed the slides and cut new sections. There were a few atypical mitoses and the possibility that this was a nonepithelial neoplasm, possibly a liposarcoma becoming a fibroliposarcoma, was considered. Six months after the operation from which this slide was derived, a simple mastectomy was performed. The breast was involved diffusely. About six months ago she developed ascites and pleural effusion. Tumor cells were found in the pleural fluid. The patient died about two and one half months ago. Unfortunately, we were unable to get permission for necropsy.

1. Cheatle, G. L., and Cutler, M.: Tumors of the Breast. Their Pathology, Symptoms, Diagnosis and Treatment, Philadelphia, J. B. Lippincott Co., 1931.

Cystic Myofibroma

History.—(Presented by Leo Lowbeer, M.D., Hillcrest Memorial Hospital, Tulsa, Oklahoma). Four years ago this 51 year old Negro woman developed abdominal enlargement and a paracentesis yielded more than 4 gallons of fluid. During the following four years she was tapped repeatedly and each time a large quantity of fluid was obtained. She was admitted to the hospital because of recurrence of abdominal enlargement. A clinical diagnosis of cirrhosis of the liver or abdominal malignancy was made and a paracentesis performed, yielding 16,000 cc. of brownish, cloudy fluid with a glistening surface scum. The scum consisted of cholesterol crystals. The specific gravity was 1.020. The protein content was high but the sediment contained only a few disintegrating cells. A preliminary pathologic diagnosis of giant intra-abdominal cyst, presumably of ovarian origin, was made and laparotomy recommended.

At operation, a huge, thick walled cyst was found firmly attached to the anterior abdominal wall, to the fundus of the uterus and to the terminal ileum. The cyst measured 35 cm. in diameter. The tubes and ovaries were identified and found to be entirely normal.

DISCUSSION

Otto Saphir, M.D., Chicago: The section (fig. 8) shows a segment of the cyst wall, the inner aspect of which is partly covered by fibrillar, acidophilic material, together with compressed, elongated and deeply basophilic cells whose long axes is oriented parallel to the fibrils. Also present are slitlike spaces and round cells. Subjacent to this are thick bands of hyalinized connective tissue and numerous cells, including lymphocytes, round cells, plasma cells and rare eosinophils. However, most prominent are the large mononuclear phagocytes and foreign body giant cells with large amounts of cytoplasmic golden brown globules which, at times, completely fill the cell. In addition, the cytoplasm contains pale, bluish brown material and nuclear debris. Occasional compressed and degenerated smooth muscle nuclei and fibers are seen. They increase in number in the deeper layers of the wall and are disposed in long and transverse bands separated by edematous acellular, wavy and delicate acidophilic fibrils. Fibroblasts also are seen. Scattered throughout the section are many large phagocytes containing golden brown globules of pigment in the cytoplasm. Infiltration by other cells is not particularly prominent. The changes in the blood vessels are striking.

The walls of the veins and arteries are thickened and often the muscularis has been replaced by connective tissue, which is irregular and simulates nodularity. Masses of relatively acellular, hyalinized or edematous connective tissue alternate with intervening thin areas. Since the intima has taken part in this process, the lumen assumes a "scalloped" appearance.

My diagnosis is a cystic myofibroma of the uterus. However, purely on a histologic basis, the diagnosis of this slide would be a cyst wall composed of smooth muscle with severe vascular changes and evidence of old hemorrhage. With the aid of the history and the appearance of the gross specimen, one can be a little bit more specific. The differential diagnosis, clinically, would have been ascites, etiology unknown, ovarian cystadenoma, and cystic myofibroma. The findings at exploratory laparotomy excluded the first possibility and the presence of two normal ovaries excluded the second. Ovarian cystomas are generally freely movable because the ovarian ligament forms the pedicle. They are not attached to the uterus or to the surrounding structures but lie free in the peritoneal cavity. The cystic myofibromas, on the other hand, are fixed to the wall of the uterus at single or multiple points and, at times, also to the floor of the pelvis. This is an example of the giant cystic myofibroma of the variety seldom seen today.

Before discussing the pathogenesis of the cyst, I might mention that the most commonly accepted theory as to the histogenesis of the myofibroma is that they arise from immature muscle cells. These tumors are most likely to develop during the physiologic and pathologic states of the uterus when hyperemia occurs, as in pregnancy and chronic pelvic inflammations. They regress during puerperium and at menopause when the blood supply decreases. This patient was approximately 47 years of age when her symptoms began. There was a moderate arteriosclerosis of the various branches of the uterine arteries and there is a tremendous arteriosclerosis in the section which was shown. One would have expected, according to the previous statement, a regression rather than a progression in the size of the cyst. However, one can speculate that at that time the myofibroma had already established an accessory blood supply from its extrauterine, and typically parasitic, attachment to the anterior abdominal wall and to the small intestines. With the decrease in the uterine blood supply and the development of necrosis, areas of degeneration, and eventually cysts, formed. At the periphery, however, one can see that the blood supply was still adequate due to collaterals, further corroborated by the beautifully preserved large and small muscle fibers.

Sections of the cyst wall, stained according to the van Gieson method, show necrosis and cyst formation. There are some areas of hemorrhage and, at one margin, intact smooth muscle fibers.

LEO LOWBEER, M.D., Tulsa: I would like to have your opinion as to the origin of this tremendous amount of fluid. Is it a product of granulation tissue from the lining of the cystic tumor, or is it related to the severe obliterating process found in the blood vessels? We still have the problem of explaining the origin of about 16,000 cc. of fluid. It seems to be an interesting phenomenon.

DR. SAPHIR: It would seem likely that the fluid was not the result of an exudation but was much more likely a transudate. There must have been tremendous compression of veins and lymphatics.



Fig. 8. Thinned out muscle fibers and severe degenerative changes.

In all the textbooks of pathology and gynecology, one finds a number of descriptions of this type. I can not recall ever having seen such a large cyst. I have seen huge ovarian cysts, cysts as the result of hemorrhagic necrosis of the pancreas filling the peritoneum, and one instance of a huge, primary cystic tumor of the kidney. But I have never seen a cystic tumor of this sort. All agree, then, that this is a cystic myofibroma.

Dysgerminoma

History.—(Presented by J. O. Boley, M.D., University of Kansas Medical School, Kansas City, Kansas). This 27 year old white man had always had cryptorchidism (intra-abdominal). In February 1947 the patient suffered multiple fractures of the right clavicle and ribs with apparent puncture of the right lung. In addition, an emergency splenectomy was performed for rupture of the spleen. During his hospital stay a diagnosis of moderately advanced pulmonary tuberculosis was made and he was transferred to a sanitarium. Shortly after that, he noted a palpable lump in the right groin. It could be displaced into the abdomen and was intermittently painful. In May of 1949, because of increasing pain, the mass was excised.

The testis measured 6 by 4 by 2.5 cm. The parenchyma about the hilus was replaced by confluent nodules of yellowish gray tissue. The cut surface bulged markedly.

DISCUSSION

Otto Saphir, M.D., Chicago: Examination of the microscopic section (fig. 9) reveals that this is a tumor of the testis. Attached to one margin are the ductuli efferentes. The testis is largely replaced by sheets, small columns and alveoli of tumor cells, separated by a varying amount of connective tissue infiltrated by small numbers of lymphocytes. The cells vary somewhat in size, shape and, in general, are quite large. They are round to polyhedral with

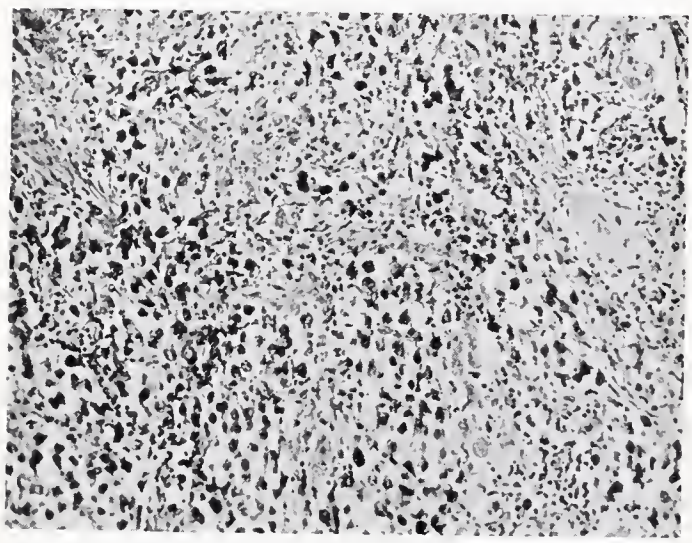


Fig. 9. Dysgerminoma. Note the variation in the staining quality of the nuclei.

distinct cell boundaries. The cytoplasm is pale, clear or finely granular. The nuclei are large with central and prominent nucleoli. The chromatin is fine and reticulated with thickening at the interstices. Numerous mitotic figures are seen. At the periphery, as well as scattered throughout the tumor, are atrophic seminiferous tubules and masses of fibrous tissue which may represent fibrous replacement of tubules. This is suggestive especially since some of the masses form one margin of the atrophic tubules.

In one area, which appears to be corpus highmori, there are irregular tubular structures lined by columnar and cuboidal cells with a brush border. Some of these are replaced by tumor cells. Thin bands of connective tissue containing blood vessels further subdivide the tumor into lobules. There is little necrosis. In addition, one sees granulomata composed of concentrically arranged fibrous tissue, epithelioid cells and a few lymphocytes and peripherally situated giant cells of the Langhans variety (fig. 10).

This tumor is a dysgerminoma of the testis. In view of the clinical diagnosis of a moderately advanced pulmonary tuberculosis, and in the presence of granulomas in the tumor, one might be tempted to add another diagnosis; namely, tuberculous granulomas of the testis. However, Friedman and Moore[1] have described their frequent occurrence in dysgerminomas. I think that the greatest difficulty in this case lies in appending a name to this tumor.

It might be helpful, at this point, to review some of the classifications of testicular tumors which have appeared in the literature. Ewing[2, 3] subdivided the testicular tumors into three types: (1) adult embryoma or teratoma; (2) embryoid, teratoid, or mixed tumors and (3) embryonal malignant tumors. Twombly[4] simplified it and presented only two types, namely; seminomas and teratomas. Karsner[5] divided these tumors into embryogenic tumors, teratomas, undifferentiated and partly differentiated tumors, seminomas, embryonal carcinomas and choriocarcinomas. Friedman and Moore differentiated them into four groups: (1) seminoma or germinoma; (2) embryonal carcinoma with chorionepitheliomas as a subdivision; (3) teratoma, and (4) teratocarcinoma. The interstitial tumors have not been included in these series. It is quite apparent that there is considerable difference of opinion. Chevassu called such tumors "seminome" because they bore an exact resemblance, he thought, to certain spermatogonia in the deeper layers of the tubules. Twombly, I believe, would have called this tumor a seminoma. Ewing would have called it an embryoma, of which seminoma is a subdivision. He felt that it arose from the rete testis, rather than from spermatoblasts, and that the seminiferous tubules either became atrophic or were secondarily invaded by tumor. Karsner agrees with him. However, Willis[6] disagrees and states that "there is progressive neoplastic change in the seminal epithelium." He does not feel that they arise from early cells. Both he and Anderson[7] would have called such a tumor a seminoma. Friedman and Moore, if I may guess, would prefer the term "germinoma" or "dysgerminoma" on the basis that the cell of origin is the primordial germ cell. As you know, they presented 922 tumors of the testes, of which 35 per cent were dysgerminomas, or, seminomas. Interestingly enough, they found seminomatous areas in 20 per cent of the embryonal carcinomas and in teratocarcinomas. In their experience both embryonal carcinomas or teratocarcinomas may contain features of dysgerminomas.

At Michael Reese Hospital we diagnose embryonal carcinoma, teratoma and teratocarcinoma on rare occasions. We try to differentiate between a seminoma, a more mature and more benign tumor composed of cells resembling certain spermatogenia, and dysgerminoma, a more immature and more malignant tumor composed of cells which resemble the primordial germ cells.

The granulomas and giant cells were described by Friedman and Moore in 1946. They stated that "giant cells of the foreign body and Langhans type were common in the peculiar stroma of many seminomas." These granulomas are also found in the dysgerminomas of the ovary.

In these photomicrographs it is evident that this is a malignant tumor. The cells bear a striking resemblance to the primordial cells. They vary con-

siderably in size, shape and staining quality. They are arranged in sheets and small columns separated by a variable amount of connective tissue and infiltrated by small lymphocytes. In this section there are several granulomas with large giant cells. This area resembles an embryonal carcinoma, presenting the problem of whether this is a dysgerminoma in association with embryonal carcinoma. In contrast, this slide of my collection is representative of a seminoma. The cells are uniform and under higher magnification resemble certain spermatogonia.

In summary, I would call this tumor a "dysgerminoma," meaning a tumor arising from gonadal cells which are not differentiated. It is, therefore, more malignant and has greater potentialities than a seminoma. On the other hand, the latter is more differentiated and the morphologic picture is more uniform. Clinically, it is not quite as malignant as the dysgerminoma.

Robert Moore, M.D., St. Louis: It is true that there is a type of tumor of the testis which on one occasion I call a seminoma and, on another, I call an embryonal carcinoma. Dr. Friedman feels that in this type of tumor the anaplasia and abnormality of the cells represent artefacts in the preparation of the sections. I am not in agreement with him on this point. I think that this is a distinctive type of tumor. I have not as yet given it a name such as

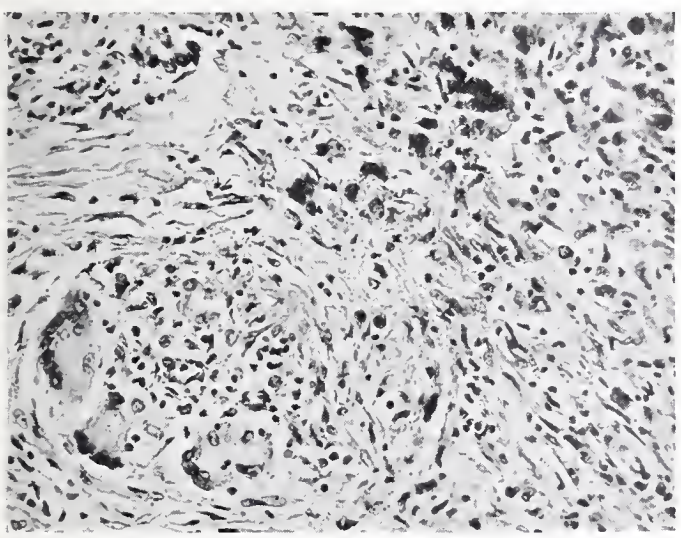


Fig. 10. Dysgerminoma. Note the granulomatous lesion and the tumor cells adjacent to it.

you have—dysgerminoma. Is the prognosis in this type of tumor different from that seen in the ordinary seminoma? Dr. Dixon is following these patients. I am awaiting his conclusions. In the lantern slides from this case, I called the first an embryonal carcinoma. However, in the last photomicrograph it looked like a seminoma. This is the type of tumor which contains characteristics of both. Whether it represents another type, or whether it is a variety of seminoma with the same clinical course, will depend on the results of the follow-up study conducted by Dr. Dixon. He is observing the course in 900 men who developed testicular tumors while in the Army.

Lauren V. Ackerman, M.D., St. Louis: I called this tumor a seminoma, and I agree with Dr. Moore that follow-up is extremely important. Equally significant is the response of these lesions to irradiation. We know that it does not make too much difference what the terminology is as long as it is known that the term "seminoma" means a tumor with a better prognosis than practically all the rest of the testicular tumors with the exception of the well differentiated teratomas. I believe that follow-up is going to be helpful.

G. J. Dixon, M.D., St. Louis: Although I thought that this was a seminoma, I was not certain. One sees all variations in the two slides shown. As a matter of fact, the granulomatous replacement may be more advanced than is found in this case. It may progress until small groups of single tumor cells are completely isolated by granulomatous tissue. I have not much to say about naming it at present; I do not think it deserves a special name. I may think differently, of course, when we have the follow-up data on our cases. In going over a series of 300 or 400 seminomas I have found no morphologic criteria which would enable me to make a distinction and say that there are really two types. It is preferable, I believe, to group all these tumors as seminomas and perhaps note gradation of change within the group. Dr. Sauer and associates reported a much better prognosis in seminomas with lymphoid infiltration than in those without. The greater the lymphoid infiltration was, the better was the prognosis.

Dr. Saphir: Of course, follow-up is as significant as morphologic classification. Whatever the nomenclature may be, the final course of the patient is important.

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Leukosarcoma

History.—(Presented by Mark C. Wheelock, M.D., Passavant Memorial Hospital, Chicago). This 55 year old man entered the hospital because of bilateral enlargement of the testes. Attention was called to this by a dragging sensation in his scrotum. Exploration operation and biopsy were performed on both sides. There were immature cells in the peripheral smear, suggestive of an aleukemic leukemia (total white count 4,800). Formal bone marrow biopsy (sternum) showed tumor.

DISCUSSION

Otto Saphir, M.D., Chicago: Invading the testis is an extremely cellular tumor arranged in a syncytium. Variation in the size and appearance of the cells is apparent (figs. 11 and 12). The connective

tissue is present as a delicate network. Vascularization is fairly rich and is in the form of small blood vessels, the walls of which are often continuous with the surrounding connective tissue. The cells are somewhat pleomorphic with sparse, often deeply acidophilic, cytoplasm. The nuclei are reniform or polyhedral. The chromatin is usually coarsely granular but, at times, is reticulated or condensed at the periphery. Mitotic figures are present. Diverse changes in the seminiferous tubules are present. Spermatogenesis is absent. In many tubules there is invasion of the basement membrane. In others, despite almost complete replacement of the tubules, occasional Sertoli cells can be identified.

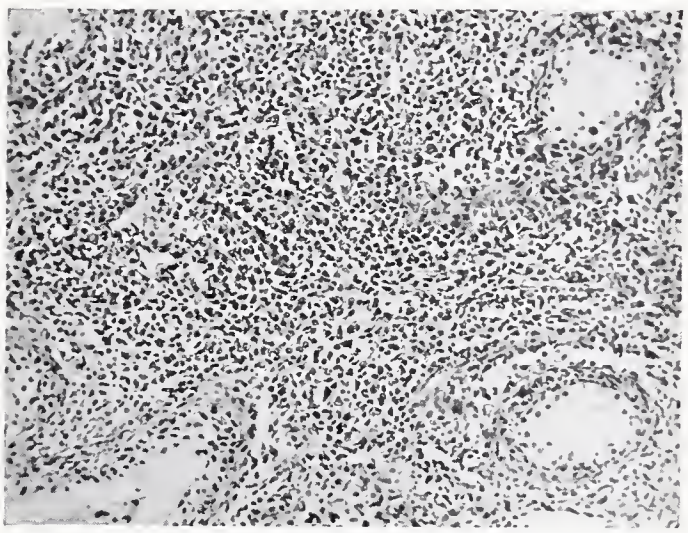


Fig. 11. Leukosarcoma. Note the diffuse infiltration of tumor cells and the preservation of testicular tubules .

My first impression in this case was that this was a lymphosarcoma of the testis. However, it is difficult to differentiate between a lymphosarcoma and a leukemic infiltration. In contradistinction to the previous case, there are many atrophic tubules, so many that the organ can be identified easily. This is an important feature in the differential diagnosis. The cells which are seen invading the tissue between the tubules are mainly round cells with little variation in size, shape and staining quality. The nuclei are hyperchromatic with either coarse or fine chromatin. The differential diagnosis rests between lymphosarcoma and leukemic infiltration.

Clinically, both testes were involved. The total white count was 4,800 and immature white cells were present in the peripheral blood smear. A bone marrow biopsy was thought to be diagnostic of lymphosarcoma. From the information at my disposal and from the sections, I believe that we are dealing with an aleukemic lymphadenosis, or sarcoleukosis, a more preferable term. By sarcoleukosis, I mean a primary leukemia, with aggressive qualities of the leukemic infiltrations. In contradistinction, and I am introducing another term for the sake of clarity, leukosarcoma is a separate entity. It is primarily a sarcoma with invasion of the circulating blood and the production of a picture simulating leukemia. Sternberg, who originally introduced the term "leukosarcoma," meant a primary leukemia with leukemic infiltrations that had tumorous characteristics rather than a primary sarcoma. For this reason these terms have been used interchangeably and the literature is confusing.

Leukemic infiltrations in the gonads occur more often than suspected. We have studied ninety-five cases of leukemia of which 75 per cent were children. The gonads were involved in thirteen cases, in six of which the leukemic infiltrations had assumed aggressive properties, both in the testis and in other organs, with the formation of tumors. One of these was a chlorosarcoma, or chloroma. Mathe[1] in 1946, stated that lymphosarcomas of the testis are rare. He reported one in a male 63 years of age. It was a unilateral tumor. He stressed that there is no lymphadenoid tissue in the normal testis; however, a primary focus may occasionally exist on the basis of an old inflammation.

Dockerty and Priestley[2] found four lymphosarcomas in a group of 400 testicular tumors. Colby[3] presented one instance of metastases to both testes in a patient with primary lymphosarcoma in the nasopharynx. Recently Watson and coworkers[4] presented three cases of testicular involvement. In two there was a lymphosarcoma of the testis and in one there was only leukemic infiltration. Two of these three cases developed simultaneous, bilateral testicular involvement following regression of the primary tumor in the nasopharynx. There are only a few cases of this type reported in the literature. It is interesting that the testicular tumor appeared while the nasopharyngeal tumor disappeared or regressed following irradiation.

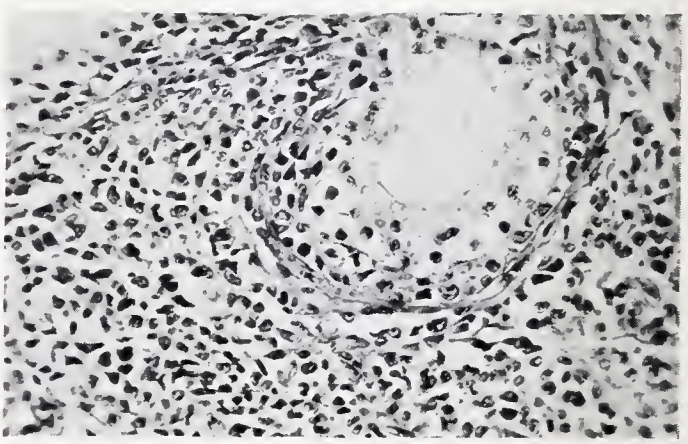


Fig. 12. Similar field—high magnification.

Shortly before this conference Dr. Wheelock informed me that this patient had died. After reviewing the sections of the liver and spleen, I thought that the patient had plasma cell myeloma. This does complicate the issue! Of course, there is a relationship between these two diseases. But, I still cannot see plasma cells in the testis. What is more interesting, however, is that someone here made the diagnosis of plasma cell myeloma from the sections of the testis.

Robert Moore, M.D., St. Louis: I was told that I looked at this slide last July and said that I did

not believe that it contained any teratoid elements or was a seminoma. It does not belong to any category of tumors that I know.

M. C. WHEELOCK, M.D., Chicago: Dr. Friedman saw it and called it a lymphosarcoma. This man did have x-ray and nitrogen mustard therapy before he died which, I think, merely hastened the course. In addition, the serum proteins were not elevated and there was no Bence-Jones protein.

DR. SAPHIR: If I remember correctly, the Bence-Jones protein test is positive in about 60 per cent of the cases of myeloma.

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Carcinoma in Situ

History.—(Presented by R. E. Johnson, M.D., Ellis Fischel State Cancer Hospital, Columbia). This 45 year old Negro woman gave a history of a slowly increasing abdominal mass for three and one half years. Examination revealed a large, lobulated, movable tumor in the lower abdomen, apparently arising from the pelvis. A biopsy of the cervix was interpreted as epidermoid carcinoma. A panhysterectomy was performed. The sections are from the surgical specimen. The patient received transvaginal roentgentherapy postoperatively.

DISCUSSION

OTTO SAPHIR, M.D., Chicago: Sharply delimited from the endocervical mucosa and appearing to be multifocal in origin, are areas of squamous epithelium noticeably increased in thickness (fig. 13). The sequential and orderly layering of the epithelium is disrupted and the basal layers are the seat of increased activity. The usual perpendicular arrangement of the basal nuclei is replaced by parallel and angular arrangement producing a disorderly picture. The prickle cell layer is increased in thickness and although the nuclei of the cornified layer are elongated and hyperchromatic they are preserved. The rete pegs are wider than usual. The cells are large, oval or polyhedral with little granular acidophilic cytoplasm and large round or oval nuclei which vary considerably in size. Many are separated from the surrounding cytoplasm by clear halos. There are numerous large pale cells with bizarre mitotic figures. Focal intercellular edema causes accentuation of the cellular membranes. Atypical mitotic figures are seen frequently in all layers of the epithelium. The latter is often seen extending along the ducts, either undermining or growing above the epithelium. Similar changes are seen in the glands.

My diagnosis is carcinoma *in situ*. Ordinarily, I avoid this term as well as adenoma malignum and preinvasive carcinoma because of the uncertainty which these terms provoke. In this instance, the diagnosis is based purely on cytologic or morphologic evidence. There is distinct anaplasia, anachromasia and many atypical mitotic figures, but no invasion. However, in some fields, the latter is simulated by the normal "dips" of the mucosa.

Is one justified in calling a tumor which is not invasive a carcinoma? Is not infiltrative growth one of the most important morphologic characteristics of carcinoma? On the other hand, one knows that there are obviously benign tumors which are invasive: neurofibromas, certain blood vessel tumors and nevi. The question also arises whether or not every carcinoma *in situ*, if untreated, will develop into an invasive carcinoma; whether, if it is a special entity, assuming this particular histologic state, will remain "*in situ*" indefinitely. Up to a period ending two years ago, we examined 1,717 cervices, of which only eight were called carcinoma *in situ*. Pund and coworkers[1] in a more recent communication maintained that incipient cancer of the cervix uteri is usually not invasive, implying that every cancer of the cervix began as a preinvasive cancer or as a carcinoma *in situ*. Galvin and TeLinde[2] recently concluded that if carcinoma *in situ* is found it should be considered strictly a histologic diagnosis and three possibilities should be considered: (1) the biopsy was taken from the periphery of an advanced cervical cancer; (2) microscopic evidence of invasive cancer is present elsewhere in the cervix, and (3) carcinoma *in situ* is present only and no invasion has yet taken place. They recommend a modified Wertheim operation with preservation of one ovary in younger women, or extensive radiation treatment. I consider this an important problem. The term carcinoma *in situ* means that there are epithelial changes which morphologically resemble those seen in a carcinoma but without invasion. I do not believe that it is an early "full-fledged" carcinoma.

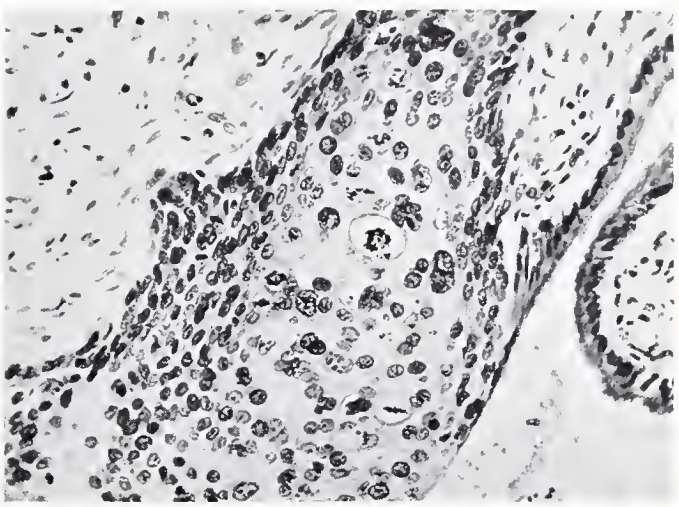


Fig. 13. Carcinoma in situ of the cervix.

It is sometimes difficult to restrain a gynecologist from doing radical sugery, once he receives a diagnosis of "carcinoma" irrespective of whether it is called "*in situ*" or "invasive." I received a biopsy of the cervix of a young woman who was 26 years

of age and in her sixth month of pregnancy. The biopsy disclosed the presence of a typical carcinoma *in situ*. I applied all my art of persuasion to prevent an operative procedure. The gynecologist agreed to follow the patient with smears and biopsies at regular intervals. That was about two years ago. The patient was delivered of a normal infant and her subsequent course has been uneventful.

About a year and a half ago, it was my privilege to be invited to the round table discussion given by the American Cancer Society to discuss the value of cytology, in particular the value of smear diagnosis of cervical and uterine lesions. One of the lengthiest discussions was on carcinomas *in situ*. TeLinde was present. Despite a long and heated discussion, we were unable to agree.

It is impossible to predict the outcome of carcinoma *in situ*, particularly when the biologic activity is unknown. The latter can be determined only in living patients. All dread assuming the responsibility of "watchful waiting." Equally unsatisfactory is the multilating panhysterectomy. Perhaps I err on the side of conservation, but I am quoting from my experience which, admittedly, is limited.

John J. Modlin, M.D., Columbia: Dr. Saphir, how many cases of carcinoma *in situ* have you seen and followed?

Dr. Saphir: Well, I cannot answer that question with any degree of accuracy because, with the exception of the one case to which I have alluded, all others have been subjected to surgery.

Robert Moore, M.D., St. Louis: I do not know what I would do. I have had a good deal of resistance against the whole concept of carcinoma *in situ*. I think it is fair to say that I was just about ready to accept the idea until I had the opportunity about two years ago to see a series of slides of cervices from pregnant women. In this series there was one example of carcinoma *in situ*, but the cervix reverted to normal after delivery. Thus, my resistance against the diagnosis of carcinoma *in situ* is building up again, particularly since it is known that hormones can produce a change in the cervical epithelium which is entirely reversible and which has been called carcinoma *in situ*.

Dr. Saphir: For the last two years we have studied changes in the cervix in normal pregnancies without seeing changes such as you have described.

Dr. Moore: I was referring to a series studied by Dr. Hellman at Johns Hopkins. Biopsies were taken in a systematic fashion during pregnancy and after delivery. In that series there was one carcinoma *in situ* and two or three others about which I was a little hesitant. However, I understand Dr. TeLinde thought they were carcinoma *in situ*.

Henry Pinkerton, M.D., St. Louis: I believe that changes like this can be produced experimentally by estrogens. Some physicians continue giving estrogens and do Papanicolaou stains until they find some malignant looking cells. I do know of at least one case in which a woman had a definite carcinoma *in situ* and later had one normal child. Two or three years later, following hysterectomy, the carcinoma was still present and was still *in situ*. The difficulty lies, I think, in determining how long the carcinoma has been present. I believe there is an opinion that it remains *in situ* for seven or eight years, but eventually invades. If a woman has had one or two children, reaches the age of 40 or 42, and still has carcinoma *in situ*, it seems prudent to do a hysterectomy.

Dr. Saphir: What would you call such lesions that are produced experimentally?

M. C. Wheelock, M.D., Chicago: I would like to mention a few cases which have been observed at Northwestern and at related hospitals. A biopsy of the cervix of a pregnant woman disclosed the presence of a preinvasive carcinoma. A hysterectomy was performed and serial sections of the cervix showed invasion. This was, of course, beyond the stage of carcinoma *in situ*. About two years ago I saw a similar case at the University Hospital in Iowa City, which was called carcinoma *in situ*. Nothing was done and, within less than a year, the woman had advanced carcinoma of the cervix. On the other hand, a woman in the Clinic of Northwestern Medical School had been seen at St. Luke's Hospital about sixteen years before. A review of the slides revealed a picture compatable with a diagnosis of carcinoma *in situ*, although this was not the original diagnosis. Subsequent cervical biopsies taken according to the recommended technic of Foote and Stewart, have failed to disclose any changes. The gynecologists have done a number of hysterectomies on patients with diagnosis of carcinomas *in situ*. In routine sections of the entire cervix they have found a number with definite invasive carcinoma. Hertig and his group at Boston are in the process of following a series of untreated cases of carcinoma *in situ*. They are going to see what will happen in the course of the coming years.

Dr. Saphir: Of course, errors can occur in the occasional cases and corroborate TeLinde's statement that the sections may have been taken from the periphery of a regular carcinoma.

Lauren V. Ackerman, M.D., St. Louis: May I say I think this lesion, also, is over diagnosed. I have even seen examples of squamous metaplasia of the cervix reproduced in a medical journal, labelled as carcinoma and operation performed. It was not carcinoma at all. Second, I think it imperative that if a cervical biopsy contains an *in situ* carcinoma, curettements should be done to determine whether or not there is invasion in some other area. And, finally, I think if it is going to be a question of treatment, one should consider irradiation therapy. The uterus nor the ovaries would be removed and transvaginal x-ray therapy would not sterilize the patient. It is important that pathologists in hospitals with a large volume of old material, review the cases of carcinoma *in situ*, and find out what happened to those patients. If these patients are not treated, and one is quite convinced that there is no invasion after curettement, then a careful follow-up for many years must be done.

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Case Report

CHOLEDOCHUS CYST

A CASE REPORT

LAWRENCE X. SULLIVAN, M.D.
PITTSBURGH, PA.
AND
EUGENE T. DMYTRYK, M.D.
ST. LOUIS

CYSTIC DILATATION of the common bile duct is an unusual anomaly. Keeley,[1] reporting a similar type of case in 1948, stated that until that time 182 cases had been found in the literature. Rogers and Priestley[2] reported one case in 1949. The present case being reported should therefore bring to 185 the total number of choledochus cysts reported.

REPORT OF CASE

A white male, aged 28 years, entered St. John's Hospital on August 30, 1949, complaining of sharp upper abdominal pain associated with intervals of burning and indigestion. The intake of food seemed to increase the intensity of the pain. Sodium bicarbonate formerly had given some relief of the pain but prior to admission had failed to relieve the discomfort. In recent weeks prior to admission he had noticed a tendency toward constipation and icterus. Three days prior to admission he had one episode of hematemesis and tarry stools.

During childhood and adolescence he experienced bouts of upper abdominal pain and vomiting. When approximately 14 years of age he was kicked in the abdomen by a calf. His father has "stomach trouble" and a grandmother died of a "cancer" of the stomach.

Physical examination revealed a well developed white male who weighed 130 pounds. The only positive findings were slight icterus of the sclerae and skin and epigastric tenderness. No abdominal mass was palpable.

Admission laboratory work revealed an anemia with an erythrocyte count of 3,110,000 and 10 grams of hemoglobin. The clotting time was two minutes, the prothrombin time was 64 per cent of normal, the icterus index was 10 units, the Van den Bergh was negative, the nonprotein nitrogen was 32 mg. per cent, the total proteins were 6.5 with an albumin-glycogen ratio of 3.6 to 2.9, the glucose tolerance was normal and the urine was positive for urobilinogen.

Roentgenographic studies of the gastrointestinal tract revealed a normal esophagus, stomach and pylorus. The duodenal bulb was well filled and relaxed. It was noted fluoroscopically, and was seen on subsequent films, that the second and third portions of the duodenum were not well filled at any time and the barium could not be expressed into this area. There was 60 per cent residue at four hours although the barium meal was in the colon at twenty-four hours. It was felt that the site of the pathologic condition could well be in the duodenum beyond the bulb.

Surgical exploration was performed on September 7, 1949, under fractional spinal anesthesia supplemented with sodium pentothal. A large cystic tumor was encountered in the right upper quadrant with the second part of the duodenum passing over the middle of the mass. This mass was covered with a peritoneal veil which had a rich blood supply. Aspiration of the mass with a syringe and needle yielded bile. The gallbladder and cystic duct were somewhat dilated and had thick walls.

The duodenum was freed from the anterior aspect of the tumor mass which was intimately adherent to the head of the pancreas medially and the posterior aspect of the second part of the duodenum. Posteriorly the mass lay on the right kidney and the medial portion rested on the bodies of the upper lumbar vertebrae. The mass extended up to the hilus of the liver and was found to be continuous with the common duct just distal to the junction of the right and left hepatic ducts.

The cystic mass was aspirated and approximately 750 cc. of bile were obtained. The cyst was opened and the proximal opening of the common duct and the cystic duct were identified with a probe. The distal opening of the common duct at the ampulla of Vater was extremely narrow. In an attempt to dilate this stenotic opening at the ampulla with a large probe a false passage was made. It was also impossible to pass the arm of a "T" tube into the duodenum through the ampulla.

At this point it was decided that the best procedure would be excision of the cystic mass and the gallbladder. This was done leaving the proximal end of the common duct intact. The distal portion of the common duct at the head of the pancreas and ampulla of Vater was closed with interrupted Dulox catgut sutures.

A loop of proximal jejunum was brought up anterior to the transverse colon and a choledochojejunostomy was performed. Approximately four inches distal to this anastomosis an entero-anastomosis was performed between the adjacent loops of jejunum. Oxycel cotton was placed in the liver bed and the raw surface around the head of the pancreas to control oozing. Two Penrose drains were inserted; one near the site of choledochojejunostomy and one into Morrison's pouch.

The postoperative course was uneventful. Gastrointestinal suction was utilized for seventy-two hours and the patient's nutritional requirements maintained with intravenous glucose, Amigen and vitamins B and C. He was discharged on September 17, 1949, the tenth postoperative day. One year after discharge from the hospital this man is in good health, has gained 50 pounds in weight and has had no chills and fever which might suggest a cholangitis.

Pathologic examination of the surgical specimen revealed a thick walled gallbladder and cystic duct with the wall measuring from 8 to 10 mm. in thickness. Microscopically, the wall was thickened, fibrotic and infiltrated with round cells. The cyst wall measured from 8 to 10 mm. in thickness. Microscopically it was a hard fibrous wall without a definite lining and a definite round cell infiltration.

From the Departments of Surgery of St. John's Hospital and St. Louis University School of Medicine.
Resident in Surgery, St. John's Hospital. (Now in Pittsburgh, Pa.)
Senior Instructor in Surgery, St. Louis University School of Medicine.

DISCUSSION

The subject of choledochus cysts is well discussed and the literature thoroughly reviewed by Shallow, Eger and Wagner.[3] This entity is found predominantly in children and young adults, with 75 per cent of the patients less than 25 years of age. Approximately 75 to 80 per cent of the cases occurred in females. Twenty-five per cent of the cases reported thus far are by Japanese authors suggesting that choledochal cysts are more common in that country.

Congenital maldevelopment undoubtedly is responsible for this abnormality. Among the theories presented to explain the congenital origin of choledochus cyst are:

1. Malformation of the choledochus.
2. Abnormal course of the common duct or angular insertion in the duodenum.
3. Congenital narrowing of the intraduodenal portion of the choledochus or stenosis due to infection.
4. Congenital weakness of the wall of the duct.
5. Congenital cystic dilatation due to infection, spasm kink, valve formation or stenosis.
6. Achalazia at the sphincter of Oddi.
7. Presence of a valve-like fold of tissue over the mouth of the intraduodenal portion of the choledochus.
8. Weakness of the choledochus wall due to rests of pancreatic tissue.
9. Origin from an abortive diverticulum of the choledochus.
10. Accessory gallbladder formations.
11. Narrowing of the duct by persistence of fetal physiologic epithelial occlusion.

Extrinsic factors of acquired origin which may produce choleochal cyst are:

1. Abdominal trauma.
2. Pressure of enlarged tuberculous mesenteric nodes on the common duct.
3. Complication of pregnancy by pressure from the enlarging uterus or kinking of the common duct due to decreased intra-abdominal pressure following delivery.

The patient in the case being reported had both congenital and acquired factors present; namely, a narrowing of the intraduodenal portion of the choledochus and abdominal trauma when kicked by a calf at 14 years of age.

Clinically, choledochal cysts are said to present a rather typical triad—tumor, jaundice and pain. Seldom are all three of the signs and symptoms present or absent. Usually one or two of the triad are definitely present. The patient in the case reported had the jaundice and pain but no palpable mass. Also as noted in the literature he had episodes of abdominal pains and vomiting during childhood and adolescence.

The surgical management consists of establishing an anastomosis between the biliary tree and the gastrointestinal tract. This may be accomplished by anastomosis of the choledochus cyst to the stomach, duodenum or jejunum. The most commonly used procedure in the past has been establishing an anastomosis between the cyst and the duodenum. This is not without danger especially when large cysts are present since they might harbor food particles and infection and give rise to an ascending cholangitis. It would be much safer to utilize a loop of jejunum for the anastomosis with the cyst and then perform a complementary jejunojejunostomy[4] or the Roux-Y principle.

Probably the most ideal operation would be the excision of the cyst wall except a portion between the hepatic ducts and the common bile duct, utilizing this gutter to reconstruct a new common duct around a T-tube.[5] This procedure was considered in this case but was impossible because of the large size of the cyst, the extremely narrow opening at the ampulla of Vater and the short arms of the T-tubes when compared to the size of the cyst. In the previously mentioned article by Shallow, Eger and Wagner[3] it is stated that extirpation of the cyst and primary anastomosis to the duodenum is the most physiologic procedure. Swartley[6] states emphatically "Excision of the cyst should never be attempted." Keeley[1] and Rogers and Priestley[2] utilized the Roux-Y type of choledochojejunostomy for the first and second times respectively.

SUMMARY

A case of a 28 year old male with a choledochus cyst is presented. The cyst was excised and a choledochojejunostomy performed with a complementary jejunojejunostomy. Before performing this type of anastomosis other procedures such as reconstruction of a common duct over a T-tube, anastomosis of the cyst to the duodenum and choledochoduodenostomy were considered and abandoned because of technical difficulties and possible cholangitis. The patient was discharged on the tenth postoperative day and is asymptomatic and 50 pounds heavier one year later.

5734 Howe Street.
607 N. Grand Avenue.

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4. Maingot: Abdominal Operations, D. Appleton-Century Co. 1940, Vol. 1, Part V. Chapter 1.
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POSTGRADUATE COURSES

(1) **ACTH & Cortisone,**
Principles and Clinical Applications
February 26-27, 1951

(2) **Electrocardiography,**
Interpretation and Principles of Standard and Unipolar Techniques
March 29-30, 1951

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From where I sit *by* Joe Marsh

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Stopped by Squint Miller's farm the other day and saw a vinegar bottle in his kitchen with an oversized cucumber inside it. The cucumber filled the whole bottle.

"What's a cucumber doing in there?" I asked him. "That's my 'blind spot' reminder," says Squint. "My grandmother kept one in her kitchen to remind her to take stock of herself now and then.

"*I slipped the bottle over the cucumber when it was just starting to grow on the vine,*" *he went on.* "*And like certain viewpoints we acquire, not noticed, it just grew and grew—now it's there to stay.*"

From where I sit, we could all take a cue from Squint and watch out for our own "blind spots." Sometimes we impose our views on our neighbor without thinking of his rights as an American—his right to follow his profession where and how he chooses, or say, his right to enjoy a glass of beer. No more "blind spots" if we keep our eyes—and minds—open!

Joe Marsh

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PRESIDENT'S PAGE

The House of Delegates of the American Medical Association was informed on December 6, 1950, that the Association was appropriating immediately $500,000.00 for aid to medical education. It was explained further that this amount was part of the National Education Campaign Fund. This fund, of course, has been created as a result of the payment by members of the $25.00 assessment in 1949 and the dues in 1950.



The announcement received enthusiastic response from the members of the House. Immediately many individual members made personal contributions to be added to the appropriation.

Since that time the Association has formed "The American Medical Education Foundation," the articles of incorporation of which are dated December 20, 1950.

Among the purposes of the Foundation are:

"To determine the need of eligible medical schools for financial aid."

"To promote the art and science of medicine by providing or aiding in the providing of financial aid to recognized medical schools."

It was further made clear that when funds are distributed to the medical schools there will be no strings attached.

This most constructive step received immediate recommendation from the press of the nation and from many physicians concerned with the plight of medical schools.

It is a further blow to those who have criticized the Association for its stand on socialized medicine as well as its opposition to federal aid for medical education.



Editorials

ANNUAL SESSION

Plans for the 93rd Annual Session of the Missouri State Medical Association, to be held at the Municipal Auditorium, Kansas City, April 22 through 25, 1951, are nearing completion. The scientific program, including the color television portion, is published in this issue of THE JOURNAL.

Committees for the Annual Session, with the exception of a Reception Committee which will be announced later, follow:

General Committee on Arrangements: Victor B. Buhler, M.D., Kansas City, Chairman; Robert W. Kennedy, M.D., Marshall, and Donald M. Dowell, M.D., Chillicothe.

Executive Committee: Victor B. Buhler, M.D., Chairman; Morris B. Simpson, M.D.; Ira H. Lockwood, M.D.; Dillard M. Eubank, M.D., and Paul A. G. Johnson, M.D., Kansas City.

Arrangements Committee: Carl R. Ferris, M.D., Chairman; Max Goldman, M.D., and Frederick B. Campbell, M.D., Kansas City.

Scientific Exhibits: Hjalmar E. Carlson, M.D., Chairman; John W. Walker, M.D.; Ralph Emerson Duncan, M.D., and Ralph R. Coffey, M.D., Kansas City.

Entertainment: William R. Eubank, M.D., Chairman; Jack E. Schiffmacher, M.D.; Campbell C. McCullough, Jr., M.D., and Albert E. Upsher, M.D., Kansas City.

Publicity: Ira H. Lockwood, M.D., Chairman; Vincent T. Williams, M.D., and Paul N. Johnstone, M.D., Kansas City.

Past Presidents' Banquet: Morris B. Simpson, M.D., Chairman; James R. McVay, M.D.; A. W. McAlester, Jr., M.D., and G. Wilse Robinson, M.D., Kansas City.

STUDENT AMERICAN MEDICAL ASSOCIATION

Student delegates from forty-eight medical schools throughout the United States, with a total enrollment of 15,855, at a meeting in Chicago on December 28 and 29, organized the Student American Medical Association.

The organization will have as its objectives: (1) the advancement of medicine; (2) contribution to the welfare and education of medical students; (3) familiarization of its members with the purposes and ideals of the medical profession, and (4) the preparation of its members to meet the social, moral and ethical obligations of the profession.

Warren R. Mullen, Jackson, Mich., a student at the University of Michigan Medical School, Ann Arbor, was elected president; Harry W Sandberg, Moline, Ill., a student at the University of Illinois College of Medicine, Chicago, vice president, and David Buchanan, Huron, S. D., a student at the University of South Dakota School of Medical Sciences, Vermillion, treasurer. Leo Brown, Harrisburg, Pa., is the executive secretary and will make his headquarters at the American Medical Association in Chicago.

The association will be made up of academic societies in medical schools of the United States approved by the Council on Medical Education and Hospitals of the American Medical Association. Each society, not more than one at any school, must have a membership of at least one fourth of the students, or eighty-five students, whichever is the smaller.

Each society shall have equal rights and equal representation in the organization's house of delegates, which will determine the policies of the association. Academic societies shall determine the qualifications of their own membership but no society may refuse membership on the basis of race, religion, color or sex. Interns may be admitted to membership at the discretion of the local society.

The house of delegates will be composed of one representative from each constituent society. It will determine the policies of the association. There will be three elective offices, president, vice president and treasurer.

Executive authority will reside in an executive council composed of the officers, seven student councilors (no two or more from the same academic society) and three senior councilors. The ten students on the council will be the elected representatives of the students. Three senior councilors will be named by the American Medical Association, which also will provide an executive secretary and headquarters in Chicago. The executive secretary, who will coordinate the activities of the student organization on a national level, shall have no vote in the council.

An advisory committee to each constituent society will be composed of the dean of the school, or his appointed representative; two faculty members elected by the students, a county medical society representative and a state medical society representative.

The student house of delegates has named its president and vice president as representatives to the American Medical Association House of Delegates. A change in the constitution of the A.M.A. to provide such representation is expected to become effective at the annual meeting in Atlantic City in June.

Until such time as the association decides to issue its own publication, space will be made available to it in the *Journal of the American Medical Association.*

Organization and Economics

NEWS NOTES

The next examination for license to practice medicine in Missouri will be given by the Missouri State Board of Medical Examiners in Jefferson City on February 19, 20 and 21. The Board will consider reciprocity applications on February 12.

The Missouri Society of Medical Technologists are attempting to complete a register of all technicians in the state, whether actively engaged or not, for purposes of civilian defense. Doctors, hospitals and technicians are being requested to send the names of both active and nonactive technicians and technologists to Miss Audrey Murphy, 404 Missouri Theater Building, St. Louis.

George Aaron, M.D., Kansas City, was the guest speaker before the Business and Professional Women's group of the Country Club Methodist Church, Kansas City, on January 14 and spoke on "What the Medical Profession Is Doing for the Care of the Sick."

Leo Loeb, M.D., St. Louis, professor emeritus of pathology at Washington University School of Medicine, was honored by the dedication to him of the December issue of *Archives of Pathology.*

Robert W. Bartlett, M.D., St. Louis, will address the General Practitioners Study Club of Greater St. Louis on February 21 on "The Differential Diagnosis and Treatment of Pain in the Right Upper Abdomen."

MUSINGS OF THE FIELD SECRETARY

Is your county medical society as such actively participating in the functioning of the local health council? If not, are some of your members taking part as individuals? It is assumed that the local health council in your community has as its primary objective the bringing together of all local health forces for a concentration of efforts to solve the health problems and improve the health conditions in the community.

It seems reasonable to believe that health councils need and will welcome the sound thinking, advice and active participation of local physicians who after all make the improving of health their life-long objective. Is not this another excellent opportunity for medical societies to demonstrate their public service functions?

Buford Hamilton, M.D., Director of the State Division of Health, has instigated a double-barreled survey of the administration and operation of his agency. The purpose is to find out how efficiently the division is carrying out its preventive program in public health and to find ways and means to improve the program. Dr. Roscoe P. Kandle, New York, field director for the American Public Health Association, and associates are making the actual survey and will present their report directly to Dr. Hamilton.

So that the people of Missouri may be better informed as to the findings of Dr. Kandle's investigation, Dr. Hamilton requested a committee of the Missouri Health Council to observe and study the survey and findings. The committee from the Health Council will report its deliberations to the executive committee of the Council and, based upon this report, the Missouri Health Council will present to the Division of Health and the people of Missouri recommendations pertinent to the purpose of the survey. Members of the Health Council committee are: Mr. Chester Starr, Director of Rural Health, Missouri Farm Bureau, Chairman; Mr. Donald E. Pratt, Executive Secretary, Missouri Tuberculosis Association; E. Royce Bohrer, M.D., Missouri State Medical Association; Dr. C. E. Lively, Chief, Department of Rural Sociology, University of Missouri; Miss Mary Brooks, Executive Secretary, Missouri Welfare Association; Mrs Burley F. Jones, Chairman, Laclede County Health Center, and Mr. H. L. C. Weier, Chairman, Jefferson County Health Center.

The first meeting of the Missouri Health Council in 1951 will be held February 13 from 11:00 a.m. to 3:00 p.m. at the Governor Hotel, Jefferson City. The program in the morning will be presented by Mr. Ralph Hammond, Director, Civilian Defense, who will discuss "Missouri Plans for Civilian Defense." The afternoon session will be composed of talks by representatives of four Health Council member organizations outlining the health programs and activities of their respective organizations. Activities to be presented will be those of the Missouri Chapter, American Red Cross; State Crippled Childrens Service, Missouri Society for Crippled Children and Adults, Inc., and the Missouri Home Economics Extension Group Council.

COMMITTEE ON INDUSTRIAL HEALTH PRESENTS PROGRAM

The Committee on Industrial Health of the Association and the Division of Health of the State of Missouri jointly will sponsor a program in St. Louis on February 13 and in Kansas City on February 14.

"Medicine, Mobilization and Manpower" is the subject which will be presented by Mr. Eugene J. Taylor, New York. Mr. Taylor is a member of the editorial staff of the *New York Times,* instructor in rehabilitation at the New York University College of Medicine, is New York City Field Representative of the National Society for



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1. LEHR, D. (1950), RELATIVE MERITS OF COMMONLY USED SULFONAMIDE DRUGS AS COMPONENTS OF MIXTURES, N. Y. STATE J. MED., 50:1361, JUNE.



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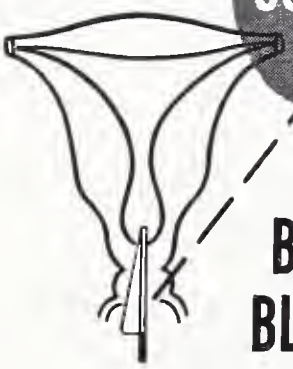


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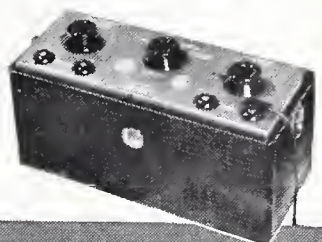


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Crippled Children and Adults, and is co-author with Howard A. Rusk, M.D., of "New Hope for the Handicapped," published by Harper & Brothers in 1949. At present Mr. Taylor is Consultant, Health Resources Office, National Security Resources Board.

Vincent T. Williams, M.D., Kansas City, Chairman of the Association Committee on Industrial Health and editor of the *Jackson County Medical Society Bulletin*, will speak on "The Industrial Physician: Health Officer of the Industrial Community."

The program will be presented at the St. Louis Medical Society Auditorium, St. Louis, at 8:15 p. m. on February 13, and at the Jackson County Medical Society Auditorium, General Hospital No. 1, Kansas City, at 8:15 p. m. on February 14. The program will be presented at the St. Louis University School of Medicine at 4:00 p. m. on February 13 for students of the senior class.

Physicians, nurses, hygienists, industrialists, personnel directors in industry and persons interested in rehabilitation are invited to attend.

A.M.A. EDUCATION FOUNDATION FORMED

Articles of incorporation for the formation of "The American Medical Education Foundation" have been issued by the Secretary of State's office in Springfield, Illinois. The papers were dated December 20, 1950.

The purposes for which the corporation was organized are:

"To promote the art and science of medicine and the betterment of public health by providing or aiding in the providing of financial aid to recognized schools or institutions of medical education responsible for the education and training of the medical manpower of the United States;

"To distribute funds, monies or contributions to medical schools and institutions;

"To determine the need of eligible medical schools or institutions for financial assistance;

"To determine the amount, manner and conditions in which and under which available funds will be distributed or granted to eligible schools or institutions."

The board of directors of the new not-for-profit corporation will consist of eleven, several members of the A.M.A. Board of Trustees and several members of the A.M.A. Council on Medical Education and Hospitals.

When the funds are distributed to the medical schools there will be no strings attached. This was made clear last December when the A.M.A. Board of Trustees first took action in initiating such a fund.

The A.M.A. has made application to the U. S. Department of Internal Revenue, requesting that donations to the fund be made tax exempt.

MISSOURI STATE MEDICAL ASSOCIATION

The 93rd Annual Session of the Missouri State Medical Association will be held at the Municipal Auditorium, Kansas City, April 22, 23, 24 and 25, 1951.

SCIENTIFIC PROGRAM OF GENERAL MEETINGS

Monday, April 23, 1951, 8:15 a. m., Little Theater, Municipal Auditorium

8:15 a. m. Color Television: Surgical.
- Cholecystectomy, V. T. Williams, M.D., Kansas City, and Residents of Kansas City General Hospital.
- Herniorrhaphy, Ralph R. Coffey, M.D., Kansas City, and Residents of Kansas City General Hospital.
- Pilonidal Cyst, Mark M. Marks, M.D., Kansas City, and Residents of Kansas City General Hospital.

Intermission to View Exhibits—10:15 to 10:45 a. m.

10:45 a. m. Edward F. Rosenberg, M.D., Chicago.

11:15 a. m. Rh and Hr Sensitization in Obstetric Practice, W. D. Beacham, M.D., New Orleans.

11:45 a. m. Temperatures During Anesthesia and the Use of Ether Bcd in Pediatric Care, John A. Bigler, M.D., Chicago.

1:30 p. m. Color Television: Medical.
- Fracture Clinic, Rex L. Diveley, M.D., and Richard H. Kiene, M.D., Kansas City.
- Arthritis Clinic, C. S. Gillmor, M.D.; James A. Jarvis, M.D., and P. L. Byers, M.D., Kansas City.
- Peripheral Vascular Clinic, F. Stanley Morest, M.D., Kansas City, and Residents of Kansas City General Hospital.

Intermission to View Exhibits—3:00 to 3:30 p. m.

3:30 p. m. Cardiac Surgery From the Standpoint of the General Practitioner, C. Rollins Hanlon, M.D., St. Louis.

4:00 p. m. Edward F. Rosenberg, M.D., Chicago.

4:30 p. m. Ectopic Pregnancy, W. D. Beacham, M.D., New Orleans.

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Tuesday, April 24, 1951, 8:15 a. m., Little Theater, Municipal Auditorium

8:15 a. m. Color Television: Surgical.
Perineorrhaphy, Kenneth Cox, M.D., Kansas City, and Residents of Kansas City General Hospital.
Total Hysterectomy, Harold L. Gainey, M.D., and James E. Keeler, M.D., Kansas City.

Intermission to View Exhibits—10:15 to 10:45 a. m.

10:45 a. m. The Use of Diuretics in Congestive Heart Failure, G. E. Burch, M.D., New Orleans.
11:15 a. m. The Caprices of Sarcoidosis, Andrew L. Banyai, M.D., Milwaukee.
11:45 a. m. Anomalies of the Gastrointestinal Tract in the Newborn Amenable to Surgery, John A. Bigler, M.D., Chicago.
1:30 p. m. Color Television: Medical.
Cardiac Clinic, A. Graham Asher, M.D., and Joseph E. Welker, M.D., Kansas City.
Tumor Clinic, E. Kip Robinson, M.D.; Victor B. Buhler, M.D.; F. J. McCoy, M.D., and Edward H. Klein, M.D., Kansas City.
Dermatology, Robert J. Murphy, M.D., Kansas City.

Intermission to View Exhibits—3:00 to 3:30 p. m.

3:30 p. m. Symposium on Hematology.
Classification of Anemias, Roland P. Ladenson, M.D., Columbia.
Classification of Leukemias, Jack H. Hill, M.D., Kansas City.
Recent Trends in Treatment, Edward H. Reinhard, M.D., St. Louis.

Wednesday, April 25, 1951, 8:15 a. m., Little Theater, Municipal Auditorium

8:15 a. m. Color Television: Surgical.
Biopsy of Breast, Carl B. Schutz, M.D., and Walton C. Ingham, M.D., Kansas City.
Thyroidectomy, Claude J. Hunt, M.D., and Walter Cummins, M.D., Kansas City.
Hemorrhoidectomy and Fissure, Frederick Campbell, M.D., and William C. Schaerrer, M.D., Kansas City.

Intermission to View Exhibits—10:15 to 10:45 a. m.

10:45 a. m. Modern Treatment of Cough, Andrew L. Banyai, M.D., Milwaukee.
11:15 a. m. Clinical Applications of Venous Pressure Measurements, G. E. Burch, M.D., New Orleans.
11:45 a. m. Modern Concepts in the Diagnosis and Management of Minimal Chest Disease, Paul W. Schafer, M.D., Kansas City, Kansas.
1:30 p. m. Color Television: Medical.
Pediatric Clinic, Edwin H. Schorer, M.D.; Frank Hogue, M.D., and Harry Gilkey, M.D., Kansas City.
Technic of the Neurologic Examination, F. A. Carmichael, M.D., and Robert W. Forsythe, M.D., Kansas City.
Disorders of the Back, F. Garrett Pipkin, M.D., Kansas City, and Residents of Kansas City General Hospital.
Disorders of the Feet, N. S. Pickard, M.D., Kansas City and Residents of the Kansas City General Hospital.

DEATHS

Reed, Roy W., M.D., Richland, a graduate of the University of Louisville School of Medicine, 1938; Fellow of the American Medical Association; member of the Phelps-Crawford-Dent-Pulaski County Medical Society; aged 35; died November 10.

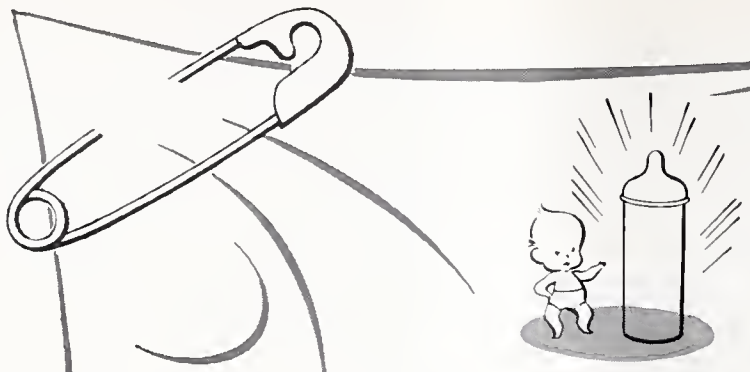
Jones, Harry L., M.D., Kansas City, a graduate of Washington University School of Medicine, 1904; Fellow of the American Medical Association; honor member of the Jackson County Medical Society; aged 73; died November 13.

Koeb, Roland Anthony, M.D., St. Louis, a graduate of St. Louis University School of Medicine, 1924; member of the St. Louis Medical Society; aged 52; died November 14.

Godfrey, George B., M.D., St. Louis, a graduate of St. Louis University School of Medicine, 1905; member of the St. Louis Medical Society; aged 72; died November 19.

Elam, William T., M.D., St. Joseph, a graduate of Northwestern Medical College, St. Joseph, 1890; Fellow of the American Medical Association; honor member of the Buchanan County Medical Society; retired; aged 84; died November 20.

Pinkston, Omar W., M.D., Kansas City, a graduate of



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the Kansas City Medical College, 1898; Fellow of the American Medical Association; honor member of the Jackson County Medical Society; aged 75; died November 29.

Grace, Clarence M., M.D., Chillicothe, a graduate of Harvard Medical School, 1916; Fellow of the American Medical Association; member of the Caldwell-Livingston County Medical Society; aged 61; died December 8.

Gregg, Arthur M., M.D., Joplin, a graduate of Washington University School of Medicine, 1905; Fellow of the American Medical Association; aged 66; died December 14.

Hyland, Robert F., M.D., St. Louis, a graduate of St. Louis University School of Medicine, 1911; Fellow of the American Medical Association; member of the St. Louis Medical Society; aged 64; died December 14.

Davis, Frank L., Jr., M.D., St. Louis, a graduate of Washington University School of Medicine, 1940; member of the St. Louis Medical Society; aged 37; died December 16.

Salter, John C., M.D., St. Louis, a graduate of Johns Hopkins University School of Medicine, 1901; Fellow of the American Medical Association; member of the St. Louis Medical Society; aged 77; died December 21.

Cheek, William C., M.D., Springfield, a graduate of Tulane University of Louisiana School of Medicine, 1918; Fellow of the American Medical Association; member of the Greene County Medical Society; aged 58; died January 4.

SOCIETY PROCEEDINGS

FOURTH COUNCILOR DISTRICT

OTTO W. KOCH, CLAYTON, COUNCILOR

Jefferson County Medical Society

The Jefferson County Medical Society held a meeting in the office of Karl V. McKinstry, M.D., DeSoto, on December 1. The meeting was called to order at 8:00 p. m. by the president, R. H. Donnell, M.D., Crystal City.

Robert J. Mueller, M.D., St. Louis, gave the scientific paper of the evening on the subject "Headache." He limited his talk mostly to chronic headache and discussed the following general types of headache: Migraine, traumatic headache, psychotic headache and the histamine cephalgia of Horton.

The following officers were elected: President, Thomas A. Donnell, M.D., DeSoto; vice president, Vernon E. Schulein, M.D., Crystal City; secretary-treasurer, John F. Rutledge, M.D., Crystal City; delegate, R. H. Donnell, M.D., Crystal City; alternate delegate, Charles E. Fallet, M.D., DeSoto.

Harold Donnell, M.D., was elected a new member, and Thomas Dobbins, M.D., was received by transfer from the Custer County (Oklahoma) Medical Society.

JOHN F. RUTLEDGE, M.D., Secretary.

TENTH COUNCILOR DISTRICT

FRANK W. HALL, CAPE GIRARDEAU, COUNCILOR

Mineral Area County Medical Society

The regular monthly meeting of the Mineral Area County Medical Society was held at State Hospital No. 4, Farmington, at 8:00 p. m., December 28.

Gene B. Starkloff, M.D., St. Louis, gave an interesting, informative and practical discussion on "Fluid and Electrolyte Balance in Medical and Surgical Treatment of Patients."

At the regular business meeting following the speaker, H. S. Knotts, M.D., Farmington, was elected to membership.

An election of officers was held. M. T. Haw, M.D., Bonne Terre, was elected president; E. F. Hoctor, M.D., Farmington, vice president, and James Stout, M.D., Farmington, secretary-treasurer.

The following members were present: Drs. Ben M. Bull, Ironton; Dailey Appleberry, Rivermines; G. L. Hawkins, Jr., Farmington; W. H. Barron, Fredericktown; S. C. Slaughter, Fredericktown; P. L. Jones, Flat River.

PAUL L. JONES, M.D., Secretary.

BOOK REVIEWS

SEXUAL DEVIATIONS by Louis S. London, M.D., Diplomate, American Board of Psychiatry and Neurology, Member American Psychiatric Association, Fellow of the American Medical Association and other medical societies, and Frank S. Caprio, M.D., Member, American Psychiatric Association, Society for the Advancement of Psychotherapy, American Medical Association and other medical societies, with a foreword by Noland D. C. Lewis, M.D., Professor of Psychiatry, College of Physicians and Surgeons, Columbia University, Director New York State Psychiatric Institute and Hospital, Editor The Psychoanalytic Review. Published by the Linacre Press, Inc., Washington 6, D. C. 1950. Price $10.00.

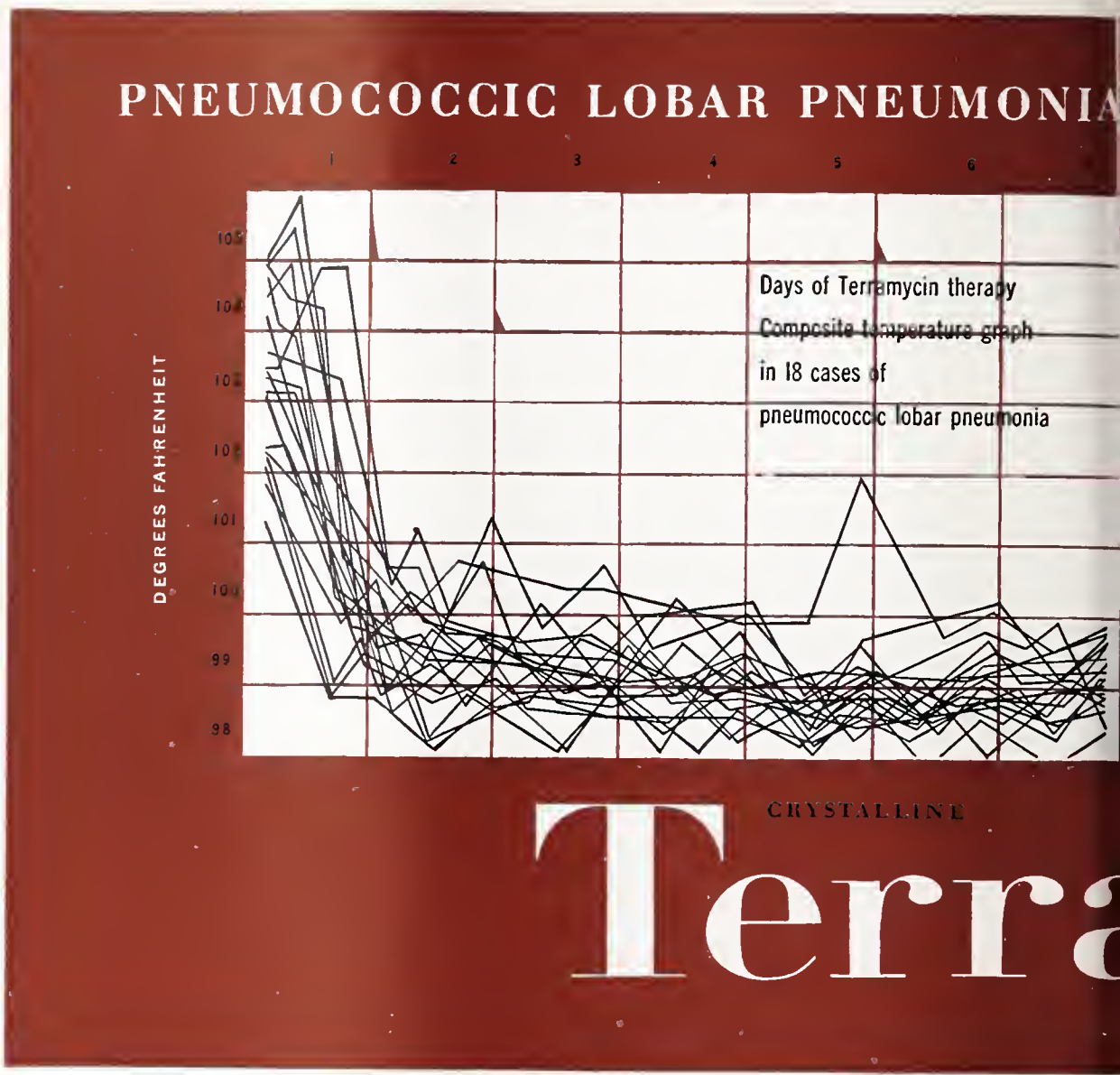
On the front page appears the brief quotation from the famous physiologist, Ivan Petrovich Pavloff. What a blessing it would be to mankind if the present dictators in Moscow would read and follow Dr. Pavloff's advice.

This book of almost 700 pages is subdivided into three parts, covering twenty chapters. At the end of the book is a good glossary defining most of the terms frequently used in all writings on psychosexual deviations and problems. Also there is much on Freudian theories and therapeutic technic.

The approach to the various problems is along the methods or instructions by Sigmund Freud. A great many cases are reported more or less in detail. Each case report terminates in a résumé of the dream-life and the psycho-dynamics. A great many psychoanalyses along the lines laid down by Freud, Adler, Stekel and others are to be found. In these many psychoanalyses in the cases reported, much attention is paid to the interpretation of the dreams reported by the patient. Many physicians might consider some of the dream interpretations as implying a great deal of the imagination.

Referring to the destructive impulse of young children, the author states: "By means of the digestive functions of his body he destroys his food." Physiologically it would be incorrect to state that the digestive organs destroy food. They merely convert food into certain elements which can be absorbed and assimilated for the welfare of the various tissues in the body. Relative to the dream-life and the interpretations of the dreams of the patient, the author states: "We are still much in darkness as to the role dream-life plays in the personality as a whole."

In reading this book, one is struck with the fact that both authors hail from Washington, D. C., and naturally some of their patients are government employees in



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Melcher, G. W. ; Gibson, C. D. ; Rose, H. M., and Kneeland, Y. : J. A. M. A. 143:1303 (Aug. 12) 1950.

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Melcher, G. W.; Gibson, C. D.; Rose, H. M., and Kneeland, Y.: J. A. M. A. 143:1303 (Aug. 12) 1950.

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1. Blake, G. F.; Frisou, G. H., and Wagner, K. R.: Yale J. Biol. and Med. [illegible] (July) 1950.

2. Herrell, W. E.; Heilman, J. R.; Weldman, W. E., and Bartholomew, L. [illegible]: Proc. Staff Meet. Mayo Clin. 25:113 (Apr. 12) 1950.

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various capacities. We are aware of the fact that investigating bodies and the press during the last year have reported that large numbers of the government employees and many in the state department in the District of Columbia are sexual deviates of one kind or another, some of them are decidedly antisocial and illegal. A. L. S.

Amusing Quotations for Doctors and Patients. Edited by Noah D. Fabricant, M.D., Grune and Stratton, Inc., New York. 1950. Price $3.00.

This volume of one hundred thirty-two pages of more than a thousand quotations from many authors is well indexed by author and subject. As the title states, the quotations are amusing; many, delightfully so. It is the sort of volume to yield pleasure for many passing moments rather than to be devoured en masse. The quotations are from the Ancients as well as the Moderns. They contain much truth, some untruth said in jest, and just enough nonsense to make one wonder how foolish man can be. Three hundred twelve biographical notes on the authors are appended. B. A. L.

Medicine of the Year 1950, second issue, editorial direction by John B. Youmans, M.D., Dean, School of Medicine, Vanderbilt University. J. B. Lippincott Company, Philadelphia, London and Montreal. 1950. Price $5.00.

The contents of this book covers nineteen different specialties, with a section to each edited by some outstanding authority in that field. There are a total of 183 reading pages which are large and in two columns of large bold print. Each section is preceded by a brief factual summary of its contents. Information is concise and condensed and is still pleasant to read.

Recent advances in treatment and criticism of older methods are surprisingly well covered considering the size of the book and how quickly it can be read. For more details about newer concepts, the reader is referred to a bibliography at the end of each section. References are limited to a few well chosen ones. There is an index of authors and one of subjects.

This is not a reference book. I think its chief value is in acquainting the general practitioner or specialist with advances in all phases of medicine and surgery so that he may better treat, advise or refer his patient. J. B. W.

Practice of Refraction, The. By Sir Stewart Duke-Elder, K.C.V.O., M.A., D.Sc. (St. And.), Ph.D. (Lond.), M.D., F.R.C.S., Hon. D.Sc. (North Western); Surgeon-Oculist to H.M. The King; Knight of Grace of the Order of St. John; Consulting Ophthalmic Surgeon to the Army and the Royal Air Force; Director of Research, Institute of Ophthalmology, University of London; Consulting Ophthalmic Surgeon, Moorfields Westminster and Central Eye Hospital; Ophthalmic Surgeon, St. George's Hospital. Fifth Edition. With 216 Illustrations. C. V. Mosby Company, St. Louis. 1949. Price $6.25.

The fact that this book is on its fifth edition attests to its popularity. The amazingly versatile Sir Duke-Elder, in his usual thorough manner, has covered the subject of refraction in all aspects.

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It is a most excellent book. W. R. E.

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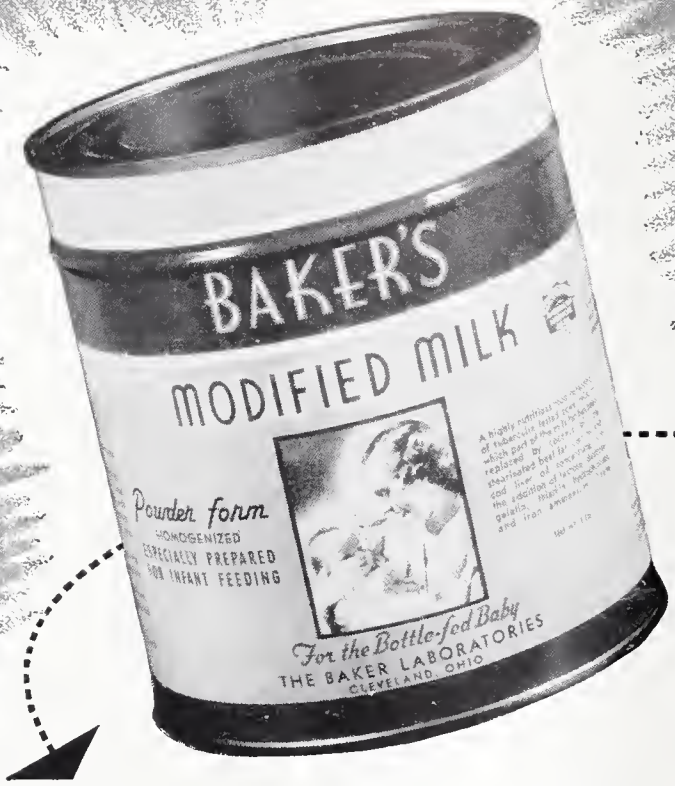
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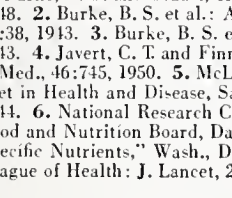
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1. Burke, B. S. and Stuart, H. C.: J.A.M.A., 137:119, 1948. **2.** Burke, B. S. et al.: Am. J. Obst. & Gynec., 46:38, 1943. **3.** Burke, B. S. et al.: J. Nutrition, 26:569, 1943. **4.** Javert, C. T. and Finn, W. F.: Texas State J. Med., 46:745, 1950. **5.** McLester, J. S.: Nutrition and Diet in Health and Disease, Saunders, Phila., 4th ed., 1944. **6.** National Research Council: "Recommended Food and Nutrition Board, Daily Allowances for Specific Nutrients," Wash., D. C., 1948. **7.** People's League of Health: J. Lancet, 2:10, 1942.

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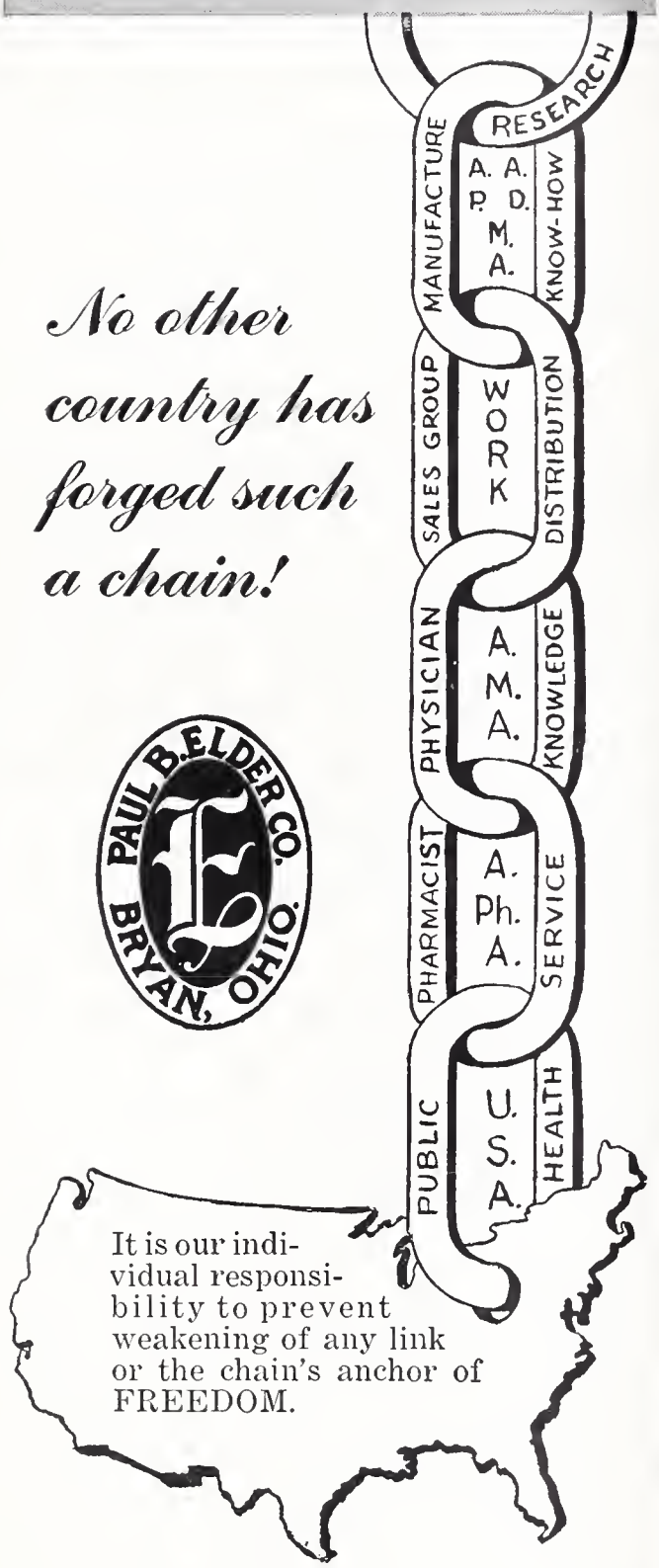
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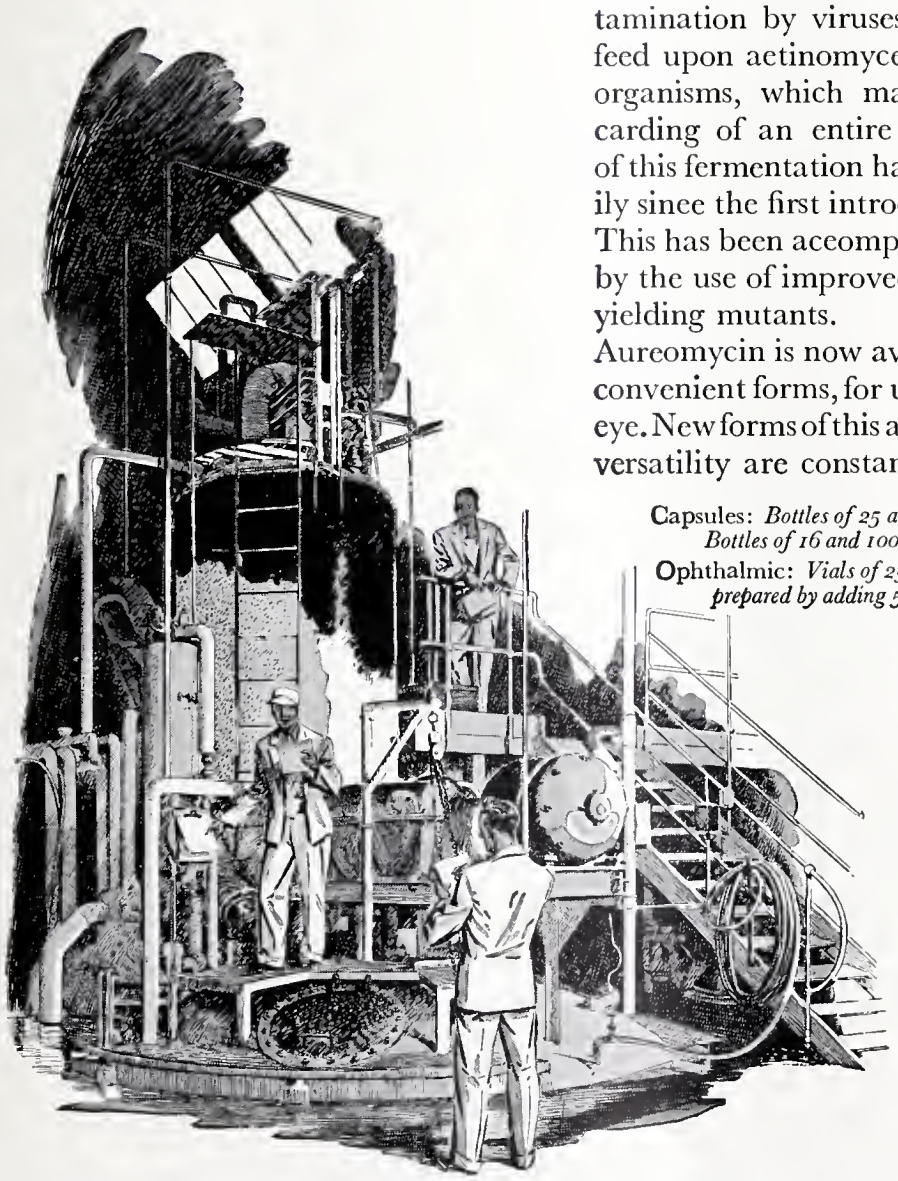
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Vol. 48 MARCH, 1951 No. 3

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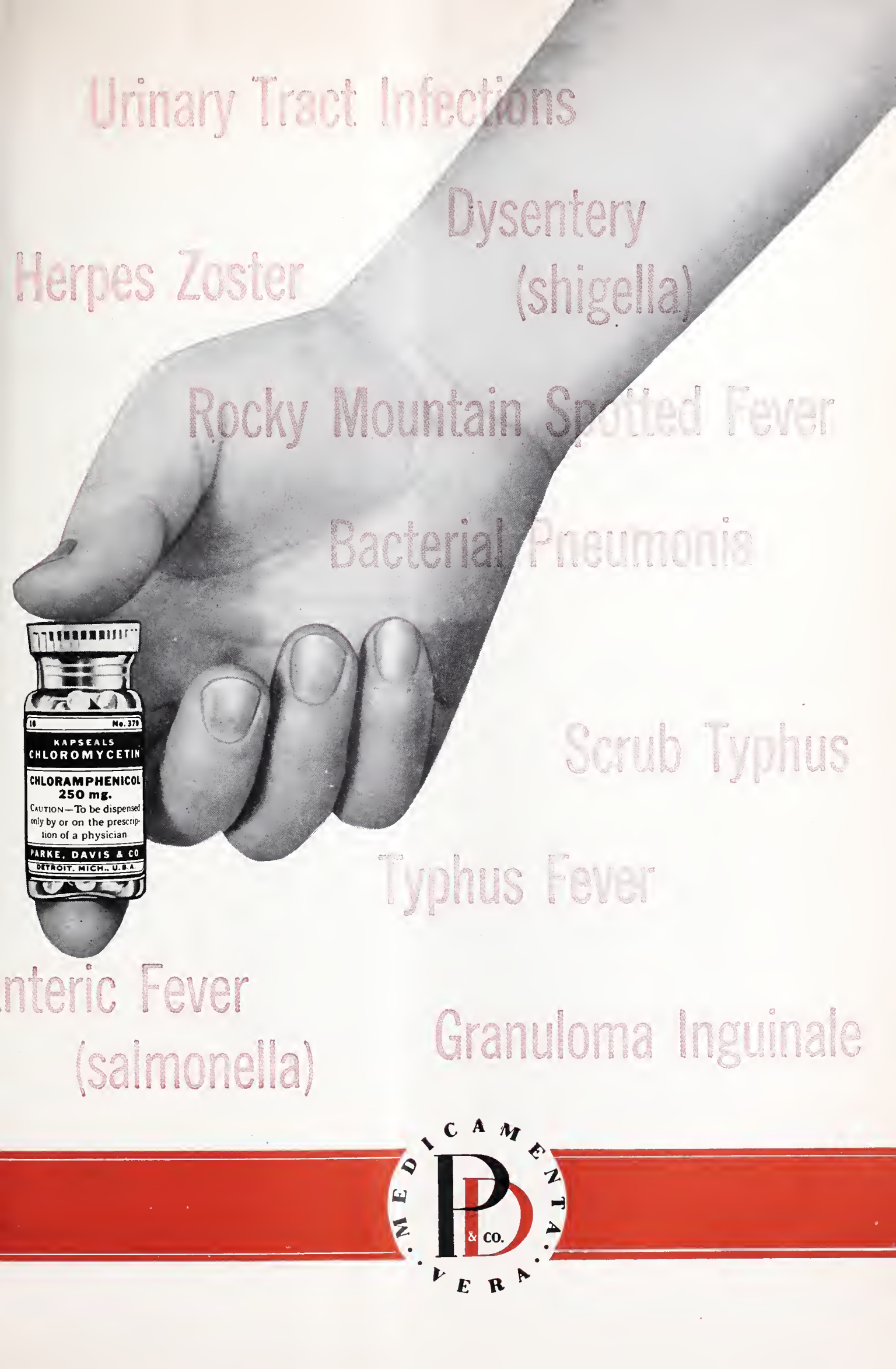
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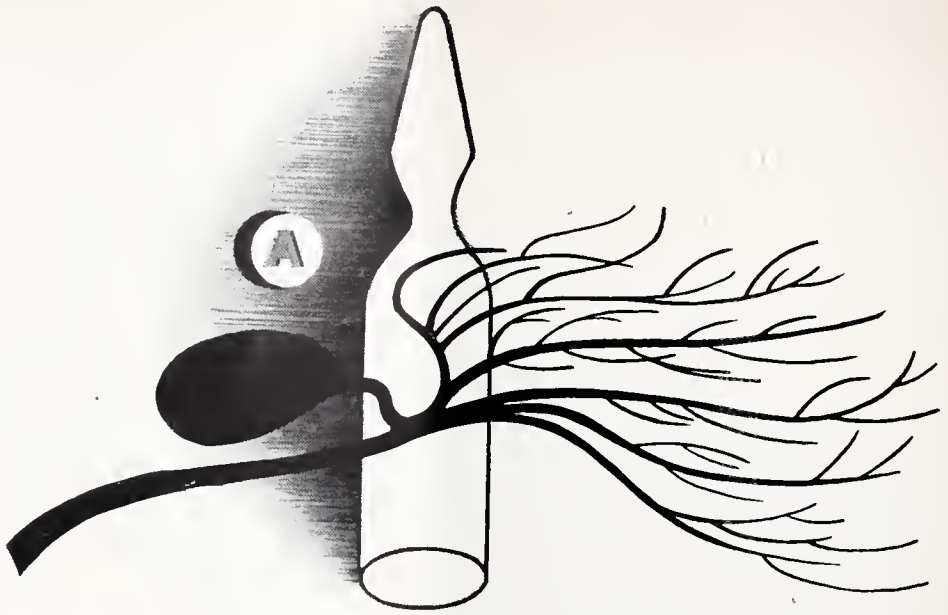
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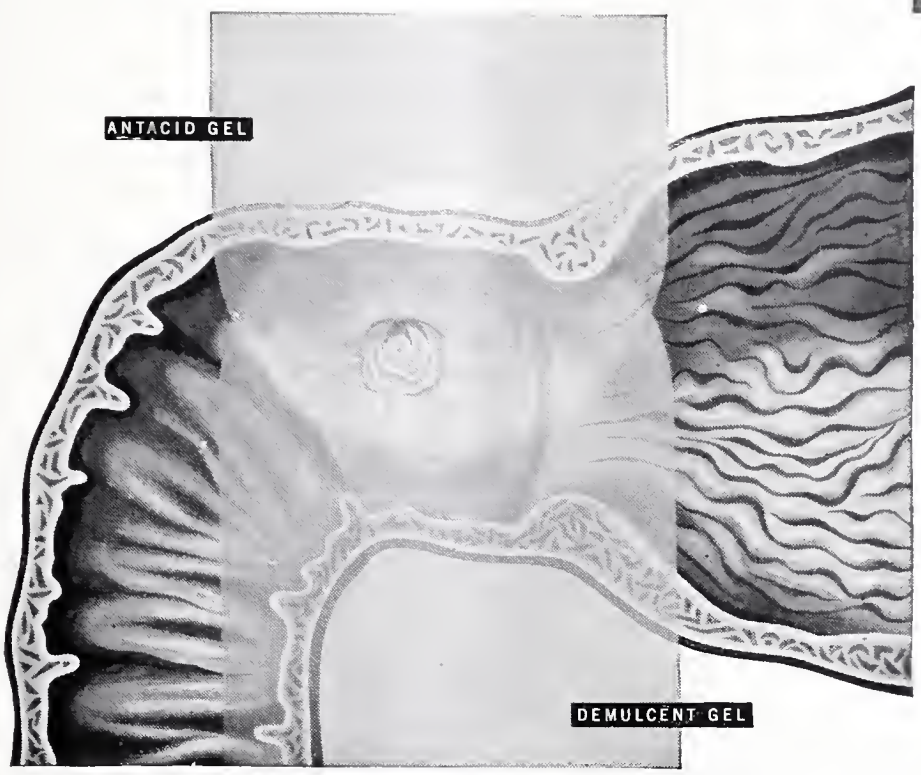
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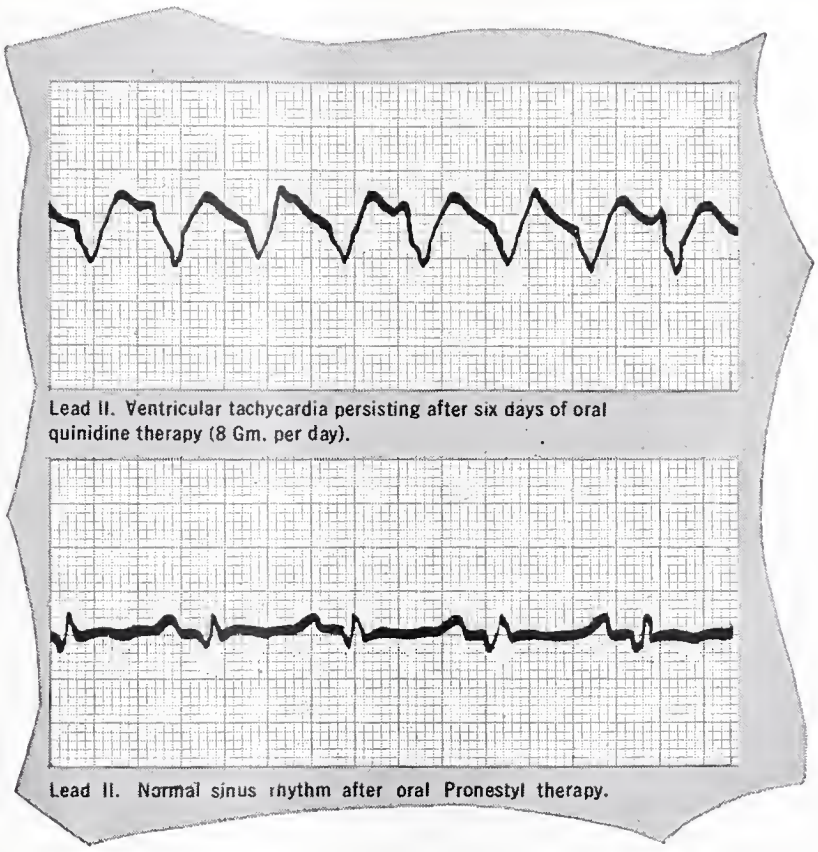
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Hanged if the ladies didn't think it was some rare kind of cat and gave it a special award! When one of them asked Slim where she could get one like it, he said, "It's all yours, M'am —I can pick up an 'Alley Cat' any time I want to!"

From where I sit, some of us are often easily "taken in" on someone else's say-so. Whether awarding prizes, passing judgment on how a man should follow his profession, or questioning our neighbor's preference for a glass of beer—let's take a look from stem to stern before making any final decision on the matter.

Joe Marsh

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Volume 48 March, 1951 Number 3

Scientific Articles

COARCTATION OF THE AORTA

REPORT OF FOUR CASES OPERATED UPON

CHESTER P. LYNXWILER, M.D.
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THE DIAGNOSIS of coarctation of the aorta is rarely made during infancy and early childhood.[1] This is a regrettable situation when one realizes that the opportune time for surgical correction is during childhood. Gross states that 40 per cent of all patients with a coarctation of the aorta die between the tenth and thirtieth year of life and that 60 per cent die by the fortieth year.[2] This is a congenital lesion in which the diagnosis can be made with certainty during life with nothing more than the use of the stethoscope, ordinary blood pressure sphygnometer and palpation for radial and femoral pulsations. The recent advances in cardiovascular surgery make the diagnosis of coarctation a matter of utmost importance.

Four cases of coarctation of the aorta that have been operated upon successfully are reported.

CASE REPORTS

Case 1. D. H., female, was 5 years of age.

History.—This patient was referred to the Heart Clinic because of a murmur known to have been present since the age of 2 years. Growth and development were normal. Only complaints were occasional leg pains and headache.

Physical Examination.—The patient was a well developed and well nourished female child. No cyanosis was noted. Blood pressure in the right arm was 140/95, in the left arm 140/90. There were no femoral pulsations. Blood pressures were not obtainable in the legs. The heart was not enlarged. No thrill was palpable. A soft precordial systolic murmur and a loud systolic murmur heard well over the entire back were present. There were no abnormal pulsations about the scapula.

Electrocardiogram.—This was normal for age and rate.

X-Ray.—The heart was at the upper limits of normal in size. There was no evidence of notching of the ribs and no pulmonary pathologic condition.

Laboratory.—Red blood count was 4.5 M.; Hb. 14 grams; white blood count 7,000; urine, normal; differential, normal; nonprotein nitrogen, 28; blood sugar, 85.

Diagnosis.—Coarctation of the aorta.

Surgery.—The patient was operated upon on February 16, 1950. Resection of the coarcted area with primary end-to-end anastomosis was performed (fig. 1).

Postoperative Course.—Course was uncomplicated except for generalized abdominal pain and complaints of pain in both lower extremities which subsided by the third postoperative day.

Postoperative Examinations.—(March 1, 1950.) Examination revealed a soft systolic murmur over the precordium which did not change in intensity with the patient in the erect or recumbent positions. Blood pressure in the right arm was 120/75, in the left arm 120/80, right leg 120/80, left leg 120/80. (June 27, 1950.) There was no change in murmur from that heard on March 1, 1950. Blood pressure in the right arm was 115/70, in the left arm 120/80, right leg 120/80, left leg 125/95.

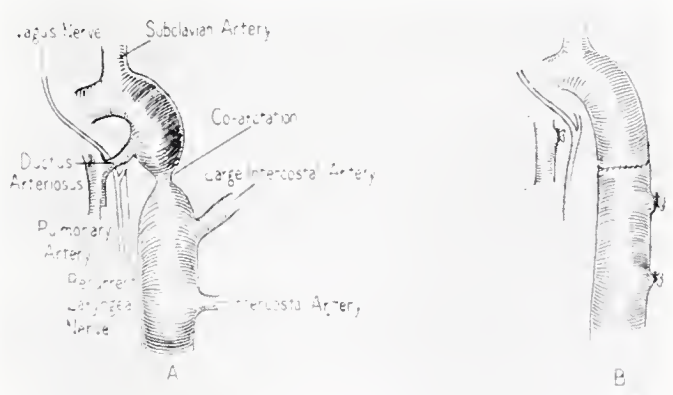


Fig. 1. (Case 1.) A. Diagram of operative finding. B. Diagram of aorta after operation.

Case 2. M. L., female, was 21 years of age.

History.—Complaints were of occasional leg pain, numbness of legs after walking, occasional chest pain

From the Cardiovascular Unit, St. Louis University School of Medicine and the St. Louis University Hospital.

and frequent temporal headaches which the patient had experienced for many years.

Physical Examination.—The patient was well developed and well nourished. Fundoscopic examination was negative. Blood pressure in the right arm was 170/80, in the left arm 180/80. Femoral pulsations were not present. Blood pressures were not obtainable in the legs. Lungs were clear to percussion and auscultation. Heart was not enlarged to percussion. Grade II systolic murmur over the anterior chest was present and heard

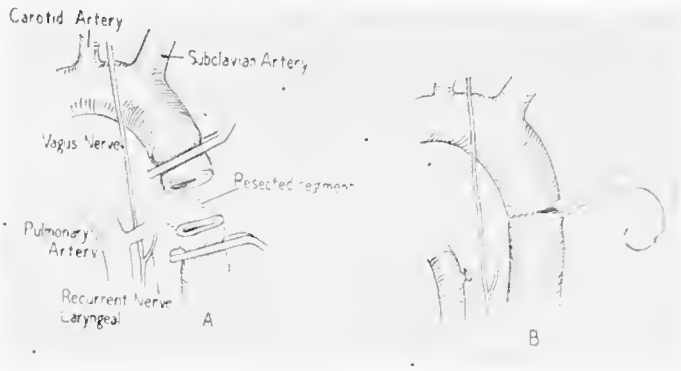


Fig. 2. (Case 2.) A. Diagram indicating portion of aorta removed. B. Diagram of end-to-end anastomosis used.

well posteriorly. No abnormal pulsations were felt over the thorax.

Laboratory.—Urine was normal; red blood count was 4:15 M.; sugar 71; nonprotein 25; phenolsulfonphthalein test showed 70 per cent excretion in one hour; white blood count was 8,000; urea clearance 86.2 per cent normal.

X-Ray.—There was minimal left ventricular enlargement and no evidence of notching of the ribs.

Electrocardiogram.—There was sinus arrhythmia but otherwise this was normal for age and rate.

Diagnosis.—Coarctation of the aorta.

Surgery.—(March 2, 1950.) Removal of the constricted area with primary end-to-end anastomosis was carried out (fig. 2).

Postoperative Course.—There was pneumothorax on the left side with complete recovery. Good femoral pulsations were obtained postoperatively. Blood pressure in the legs rose gradually to 130/78 in the right leg and to 122/80 in the left.

Discharge.—On discharge (March 15, 1950) there was a soft systolic murmur over the base of the heart and heard posteriorly, but not as loud as at the time of admission.

Postoperative Examinations.—(April 20, 1950.) There was no cardiac enlargement and no murmurs were heard. Blood pressure in the right arm was 100/70, in the left arm 95/70, right leg 110/80, left leg 105/75. (August 20, 1950.) There was no cardiac enlargement and no murmurs. Blood pressure in the right arm was 100/65, in the left arm 100/70, right leg 100/80, left leg 115/80.

Case 3. D. C., male, was 7 years of age.

History.—The patient entered St. Mary's Hospital for plastic surgery on January 19, 1950. He had undergone plastic operations two years previously. Cardiac murmur was known to have been present for at least two years prior to the present admission. To that time there had been no signs or symptoms referrable to the cardiovascular system.

Physical Examination.—The patient was a small, well developed male. Harsh systolic murmur was present over the base of the heart, loudest in the second left intercostal space and heard posteriorly between the scapulae. There was no evidence of cardiac enlargement. Pulse in the right and left arms showed definite difference. No pulsations were felt over either femoral artery. Blood pressure in the left arm was 120/70, in the right arm 0/0. No blood pressure reading was obtainable in either leg. The patient had many scars about the face, neck and hands as the result of a burn sustained three years previously.

Laboratory.—Red blood count was 3.75 M., Hb. 11.5 and white blood count 14,000.

X-Ray.—The lung fields appeared normal. The heart was of normal size and shape.

Retrograde Arteriogram.—Injection of 30 cc. of 70 per cent Diodrast in the left common carotid artery revealed constriction of the aorta just inferior to the origin of the left subclavian artery. Beyond the area of constriction, the aorta was dilated. No evidence of extensive collateral circulation was seen (fig. 3).

Electrocardiogram.—This was normal for age and rate.

Impression.—Complicated coarctation of the aorta with possible anomalous right subclavian.

Surgery.—(February 9, 1950.) Coarctation was corrected by means of a left subclavian by-pass type of operation (fig. 4).

Postoperative Examination.—(April 10, 1950.) No evidence of cardiac enlargement or decompensation was



Fig. 3. (Case 3.) Retrograde arteriogram showing area of constriction (arrow) and absence of extensive collateral circulation.

found. There was a soft systolic murmur over the precordium, not heard posteriorly. Blood pressure in the right arm was 80/60, in the left arm 100/70, right leg 85/70, left leg 90/70.

X-Ray.—Lung fields appeared normal. No cardiac abnormalities were found.

Case 4. J. K., male, was 7 years of age.

History.—This patient had complained of leg pains for about four years. These pains occurred usually after exercise. There was an occasional complaint of malaise and lassitude but no other symptoms were noted. He was examined at the age of 5 years but no abnormal physical findings were noted. Several months later he developed meningitis, was hospitalized and a heart

murmur was noted for the first time. Since that time he had been on restricted activity.

Physical Examination.—Examination revealed a sturdily built male, slightly obese. Pulse was full and equal in both wrists, temporal pulsations marked; femoral and dorsalis pedis pulsations were absent. The heart was not enlarged and auscultation revealed a soft murmur along the left sternal border. This murmur was heard well posteriorly. There was no thrill present. Blood pressures were not obtainable in the legs. In the arms the blood pressure was recorded as 158/110 in the right arm and 168/118 in the left arm. The lungs were normal on percussion and auscultation.

Fluoroscopy.—The heart appeared enlarged to the left, the aortic knob was well visualized and the descending aorta appeared dilated.

X-Ray.—X-ray confirmed the fluoroscopic findings; notching of the ribs was not present.

Electrocardiogram.—There was left ventricular preponderance.

Impression.—Coarctation of the aorta.

Retrograde Arteriogram.—Injection of 30 cc. of 70 per cent Diodrast in the left common coratid artery revealed constriction of the aorta just inferior to the origin of the left subclavian artery. The aorta was dilated beyond the area of constriction (fig. 5).

Surgery.—(July 27, 1950.) Operation for coarctation of the aorta was performed. Surgical removal of the constricted area with primary end-to-end anastomosis was done.

DISCUSSION

One is impressed with the paucity of symptoms in these four patients. Except for the occasional complaint of headache and vague leg pains, their histories were normal. In all four instances, growth and development was normal and it is this fact that

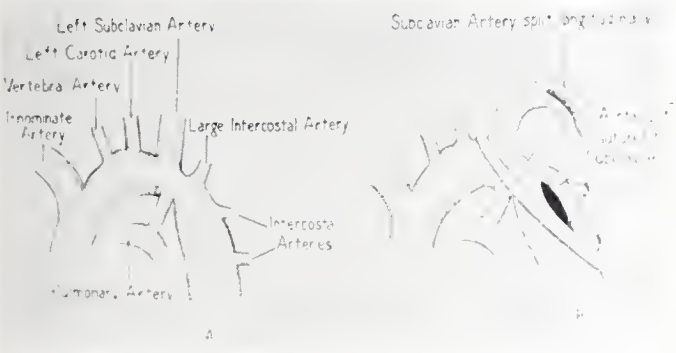


Fig. 4. (Case 3.) A. Diagram of anatomic finding at operation. B. Diagrammatic representation of surgical correction.

makes it difficult for the parents of such patients to realize fully the seriousness of this malformation.

None of these cases exhibited notching of the ribs on x-ray examination. While this is a common finding in adults, it is rare in children.

In three patients (cases 1, 2, 4) surgical correction of the coarctation was accomplished by removing the constricted segment and anastamosing the ends of the aorta. In 1945 both Croaford and Gross successfully operated on patients with a coarctation using this method.[3,4] In case 3 a subclavian by-pass type of operation was done. This procedure was first suggested by Blalock and Park in 1944.[5] It was not until 1947 that Clagett reported the first surgical correction of a coarctation in a human subject using this operative procedure.[6] Gross in 1948 reported the first successful use of human arterial grafts in treatment of coarctation.[7] This procedure is the one of choice when the area of aortic constriction is long and its removal will not permit the free ends of the aorta to be anastamosed. It is also of advantage in adults as the aorta is less mobile in adults than in children. We were fortunate that in these patients the area of



Fig. 5. (Case 5.) Retrograde arteriogram right anterior oblique showing area of constriction (arrow) and poststenotic dilitation of aorta; also extensive collateral circulation. (Note large tortuous internal mammary artery.)

constriction was short permitting end-to-end anastomosis except in case 3. In case 3 it was necessary to do the subclavian by-pass type of procedure because of the location of the coarcted area. In this patient an end-to-end anastomosis could be accomplished only by disturbing the left subclavian and carotid arteries. By using the left subclavian bypass operation the carotid vessels remained intact.

It is of additional interest in this particular case that, following operation, a blood pressure was obtained in the right arm also. This tends to confirm the original diagnosis of an anomalous origin of the right subclavian artery as this was probably below the area of coarctation and only after successful correction of the coarctation a pressure could be obtained in the right arm.

The visualization of the aorta preoperatively is of value in demonstrating the site, extent and severity of the coarcted area. This is of obvious advantage to the surgeon. We have preferred to use the retrograde injection of Diodrast through the left common carotid artery as described by Freeman[8] and others.[9] The intravenous injection as described by Robb and Steinberg[10] is not a satisfactory method because the opaque media has to pass through the pulmonary vascular bed and is thus diluted to such an extent that proper contrast is not achieved in the aorta. The injection of a contrast media into the cardiovascular system is not without danger to the patient. A statistical analysis of this problem has been reported by Dotter and Jackson.[11]

SUMMARY

Four cases of coarctation of the aorta successfully corrected by surgical procedure are reported. The three types of surgery available for such cases are mentioned. Two of the three types of surgery available were used in these patients. In three instances the coarctation was corrected by resection of the constricted area with primary end-to-end anastamosis and in one case the subclavian by-pass procedure was used.

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REPORT IMPROVED NERVE BLOCK TECHNIC IN PAINLESS CHILDBIRTH

An improvement of the nerve block technic in painless childbirth—which involves only one site of injection instead of the former two or four—is described in the February 10 *Journal of the American Medical Association.*

Orlen J. Johnson, M.D., Bay City, Michigan, reports that he has used the new technic on 161 women, of whom ninety-two were becoming mothers for the first time.

With skilled injection, he explained, the patient complains of no discomfort. He added that no reactions from the procaine or complications have been encountered and that there has been no greater discomfort or delay in the healing of the surgical incisions.

The most satisfying results, he reports, are obtained if the nerve block is made during the second stage of labor.

According to Dr. Johnson, the advantages of the nerve block method are: (1) greater cooperation of the patient and control of the baby's head as it advances through the birth canal; (2) less damage to the mother's tissues; (3) less surgical intervention on the part of the obstetrician; (4) no ill effects on the baby from this type of anesthesia; (5) lessens chances of hemorrhage.

AUREOMYCIN, CHLORAMPHENICOL EFFECTIVE IN MIXED BACTERIAL INFECTIONS

Two Cincinnati physicians report that aureomycin and chloramphenicol have brought good results in their treatment of a large number of mixed bacterial infections.

"The results of treatment (on 233 patients) with either of these antibiotics and the indicated surgical procedure were good in a majority of instances, the invasive qualities of the infection being quickly over come and the local manifestations of the infection disappearing at varying rates," write Drs. William A. Altemeier and William R. Culbertson in the February 17 *Journal of the American Medical Association.*

FACTORS IN PSYCHOTHERAPEUTIC SUCCESS

IVAN N. MENSH,
ST. LOUIS
AND
JANET M. GOLDEN,
ST. LOUIS

The questions posed by the practice of psychotherapy are many and varied, and basic to all questions is the problem of prediction. Will the patient improve? Is the therapeutic relationship to be a long term, intensive effort or a relatively short and supportive one? What kind of patient is seen in therapy and what predictions may be made from knowledge of the patient and therapy variables?

Veterans of World War II comprise about 10 per cent of the total population and among this veteran group many thousands have had psychotherapy during and since the war. Because such a large sample is represented, even though it definitely is a selected one in terms of military and naval selection procedures, we undertook to study patient and therapy variables of a sample of veterans in treatment for psychiatric illness. The sample to be reported numbers 575 male veterans seen therapeutically during the period of January 1946 to June 1948, inclusive. This is a total sample for the period, excluding only sixty-three male veterans who did not return after an initial contact during which only a brief history was taken, and twelve female veterans who were not included because their number was so small in the total sample. The veterans all were seen in a Veterans' Mental Hygiene Contract Clinic and the case of each had been closed before the end of June 1948.

The case records of the veterans were coded for the factors shown in table I, and an IBM card was punched for each case. The 575 cards then were sorted for the various factors and the distributions are reported in table I. It can be seen that there are numerous approaches to this study in that any of the factors may be used as a baseline against which to sort. It was felt that a fruitful approach might lie in the relationship to the other variables of the number of therapeutic sessions experienced by the patients. A second report now in preparation deals with the family situation in which the patient was reared, and against the six categories of this factor there were sorted the other patient and therapy variables.

Inspection of table I shows a typical or modal patient among his 574 fellows. For the sample under study this "typical" veteran was in his twenties, married, white, and ex-Army with from two and one-half to three years of service including combat experience. He was not an only child or

The opinions expressed here are those of the authors and do not represent the opinions or policy of the Veterans Administration.

Acknowledgment is made to Mrs. Barbara Richman for coding the records, and to Mr. Ralph Hollerorth and his staff for assistance in punching and sorting the IBM cards.

oldest or youngest of his siblings, and had been reared in an intact family situation. The veteran had applied for a pension because of his disability and had been referred to the Clinic by a Veterans' agency. He was accepted for treatment in the winter of 1946 after an interview by a social worker, was treated less frequently than weekly but more often than monthly, and no other member of his family had been brought under treatment. Once under treatment, he broke no appointments before discontinuing treatment. Therapy was terminated by him rather than by the therapist in the spring of 1947. The therapist noted that the veteran's psychiatric status had not improved but did not note what disposition of the case followed and the illness was diagnosed as psychoneurosis.

This "typical" veteran in psychotherapy reflects principally the characteristics of the 372 veterans who were under treatment fewer than five sessions, a group which constitutes 65 per cent of the total number of 575 patients. Thus, two out of three veterans came for therapy less than five times. The characteristics of this large group are similar to those just reported for the "typical" veteran except that the one to four sessions group had not applied for a pension and were terminated in 1946.

Table 1. *Per cent distribution of 575 veterans in psychotherapy; patient and therapy variables arranged according to number of therapeutic sessions.*

Factor	Total group	No. therapeutic sessions 1-4	5-9	10-19	20-
Number	575	372	116	62	25
Per Cent	100.	65.	20.	11.	4.
1. Age					
a. 'teens	2	2	3	0	4
b. 20's	60	58	58	64	68
c. 30's	33	33	36	31	28
d. 40's	5	7	3	5	0
2. Marital status					
a. single	43	42	44	44	40
b. married	50	50	53	52	48
c. separ., divorc., wid.	7	8	3	4	12
3. Race					
a. white	88	86	89	95	96
b. negro	12	14	11	5	4
4. Branch of service					
a. Army	72	72	75	71	68
b. Navy	23	24	21	24	16
c. Marine	5	4	4	5	16
5. Length of service (mths.)					
a. less than 10	9	9	9	6	8
b. 10-19	9	11	7	6	4
c. 20-29	19	17	22	21	24
d. 30-39	34	35	33	33	24
e. 40-	29	28	29	34	40
6. Combat experience					
a. combat	59	57	62	69	48
b. no combat	41	43	38	31	52
7. Position of patient in family constellation					
a. only child	15	14	17	16	12
b. oldest	24	26	23	18	28
c. youngest	26	23	31	35	28
d. other	35	37	29	31	32
8. Family situation in which patient was reared					
a. family intact	44	43	45	41	32
b. mother dead or deserted	9	11	7	10	4
c. father dead or deserted	16	18	14	11	8
d. both parents dead or deserted	6	6	6	11	4
e. friction of parents	16	15	17	16	36
f. friction with father	9	7	11	11	16
9. Application for pension					
a. filed	74	42	76	84	68
b. did not file	26	58	24	16	32
10. Referral source					
a. V. A.	39	38	41	42	40
b. Veterans' organizations	17	19	15	15	16
c. Am. Red Cross	8	8	7	6	12
d. interested person	5	5	2	8	0
e. family or relative	2	2	2	2	0
f. school	5	3	10	11	0
g. hospital or doctor	14	15	13	13	12
h. social agency	2	1	3	0	8
i. self	7	8	6	3	12
j. religious groups	1	1	1	0	0
11. Accepted for treatment (season)					
a. winter	43	46	39	36	20
b. spring	21	20	22	26	36
c. summer	20	19	23	14	36
d. fall	16	15	16	24	8
12. Accepted for treatment (year)					
a. 1946	52	56	50	42	32
b. 1947	40	37	41	42	64
c. 1948	8	7	9	16	4
13. Other family member treated					
a. no other	78	83	72	63	60
b. wife	14	8	23	26	32
c. other	8	9	5	11	8
14. Initial clinic contact					
a. intake interview	89	88	89	97	88
b. no intake interview	11	12	11	3	12
15. Frequency of treatment					
a. weekly or more often	21	19	22	24	52
b. monthly or more often	13	18	31	32	24
c. other intervals	66	63	47	44	24
16. Number of appointments broken					
a. none	36	43	32	6	12
b. 1	30	36	20	19	12
c. 2	16	12	26	16	28
d. 3	8	5	10	18	12
e. 4	6	3	10	16	4
f. 5 or more	4	1	2	25	32
17. Final appointment					
a. kept	46	40	53	63	68
b. broken	54	60	47	37	32
18. Treatment terminated (season)					
a. winter	25	29	19	21	8
b. spring	33	33	36	26	36
c. summer	20	19	19	16	44
d. fall	22	19	26	37	12
19. Treatment terminated (year)					
a. 1946	37	47	24	13	0
b. 1947	46	44	58	40	24
c. 1948	17	9	18	47	76
20. Treatment terminated					
a. by therapist	47	48	44	45	48
b. by patient	53	52	56	55	52
21. Psychiatric status of patient at close of treatment					
a. no change, unimproved	61	70	44	44	40
b. improved	39	30	56	56	60
22. Disposition of patient following treatment					
a. none noted	65	64	72	66	40
b. social agency	13	13	11	11	24
c. hospital	11	12	7	10	20
d. clinic or doctor	11	11	10	13	16
23. Therapist's diagnostic impression					
a. epilepsy or mental deficiency	2	3	2	16	4
b. psychoneurosis	63	61	67	61	76
c. character disorder	10	11	10	10	4
d. psychosis	11	10	9	10	8
e. other	14	15	12	3	8

Examination of the profile of the modal veteran in the five to nine sessions group shows that there are certain differences between this group and the modal profile of the entire sample of 575 veterans. The youngest child in the family constellation is the modal position. The group who had from five to nine sessions kept the final appointment, was terminated in 1947 and the therapists noted that the psychiatric status of this group after treatment was improved.

The sixty-two veterans who came to from ten to nineteen sessions have a modal profile which shows even more differences from the total group mode than does the group of five to nine sessions. This ten to nineteen sessions group had been in service from forty to forty-nine months as contrasted with the thirty to thirty-nine months of the first two groups. The modal position was youngest child in the family constellation as in the five to nine sessions group, five or more appointments had been broken but they kept their final appointment as had the five to nine sessions group. They terminated treatment in the fall of 1948 and were noted as improved. Thus, the ten to nineteen sessions group is similar in its characteristics to the

five to nine sessions group but unlike the group having from one to four sessions.

Still more differences from the total group "typical" veteran in psychotherapy are seen in the group which came for the longest therapeutic series, the twenty or more sessions group. Although this group also had been in service for from forty to forty-nine months as had the ten to nineteen sessions group, the former was the only group whose modal veteran had not experienced combat. Further, this was the only group whose modal family situation was that the patient had been reared where there had been friction between his parents.

Table 2. *Relationship between number of psychotherapeutic sessions and psychiatric status at close of treatment.*

Number of sessions		*Improved (352) Per Cent*		*Unimproved (223) Per Cent*	
1		7		35	
2		12		20	
3		15		11	
4	1-4	15	49	9	75
5		8		5	
6		9		3	
7		5		3	
8		5		2	
9	5-9	2	29	1	15
10-14		11		5	
15-19		4		2	
20-	10-	7	22	3	10
			100		100

Also, these veterans were accepted for treatment in the spring and summer rather than in the winter as was true with the modal veteran of the other three groups. They came for treatment in 1947 and came frequently, weekly or more often, but broke five or more appointments after which they kept the final appointment for therapy. Treatment was terminated in the summer of 1948 and they were improved psychiatrically.

The modal comparisons reported in terms of differences among the veterans of the four groups categorized on the basis of the number of therapeutic sessions experienced are interesting also because of the relationships appearing between the factor of the number of therapy hours and the other factors in table I. The modal treatment of data is not, however, a rigorous statistical test of significance of differences or relationships. The technic best suited for such a test of significance is the chi-square method.[1] This method of statistical analysis yielded information on the probabilities that observed frequencies in the distribution were significant departures from theoretical frequencies calculated from marginal totals of the 2 by 2 tables set up for the various factors. Chi-square values were not computed in cases in which cell frequencies were fewer than five. As criterion of significance, the generally accepted level of P in the .05-.01 range was used. P values for the twenty-three factors and four groups summarized in table I were of the order of .50-.001, but only those of .05-.001 range will be reported as significant.

1. Peatman, J. G. Descriptive and sampling statistics, New York: Harper & Bros., 1947.

More than 90 per cent of the 575 veterans studied were in the 20 to 39 year age range and there were no significant differences between the four groups with respect to age. About half of the total group were married and again there were no inter-group differences of significance. More than nine out of ten patients were white, and chi-square tests showed no significant differences in this factor for the various groups. Branch of service reflects the wartime distribution of numbers in the armed services, with the Army numbering more than 70 per cent, the Navy about a third of that proportion, and the Marines about 5 per cent of the total. Thus, no one service appeared to contribute more than its expected proportion although it is believed in some quarters that the less rigorous selection of the Army would result in greater incidence of neuropsychiatric casualties. This is not supported in the present sample, yet there is a significant difference between the ex-Marines who came twenty or more times for therapy and the other groups, and three times as many, proportionately, came for these long periods, approaching the proportions found in the Navy sample which was more than twice as numerous. This finding may suggest the long term effects of the discipline on which the Marine Corps prides itself.

A third of the total group of veterans had experienced from two and one-half to three years of service; only about one out of ten had been in service less than a year and nearly 30 per cent had seen more than three years of service. Although there are modal differences between the veterans who came fewer than ten times for psychotherapy and those who came ten sessions or more, in that the latter modally had ten more months of service than the former groups, this difference is not statistically significant. Similarly, with respect to combat experience, the apparently large differences between the four groups, particularly the ten to nineteen and twenty plus sessions groups, are not significant as the P values were of the order .10-.05.

Many students of personality have emphasized the significance of the role of birth order or position of the individual in the family constellation and the stresses peculiar to various of the positions. The sample under study, as summarized in table I, did show significant differences between the four groups, and there were fewer oldest but more youngest children in the ten to nineteen sessions group than in the one to four sessions group. The other apparent differences under factor 7 have P values of the order of .30-.20. Closely related to the background factor of birth order is the family situation in which the patient was reared (the psychologic milieu). Nearly half of the patients came from intact families and the relatively smaller proportion in the long term, twenty or more sessions group, is not significantly different from the three other groups. The one difference in the family situation factor which stands out and is statistically significant is that of friction between the parents of

the patient in therapy. More than a third of the veterans who came for the longest series of therapy reported that there had been interparental friction, compared to an incidence of 15 to 17 per cent in the other groups.

The veteran's application for a pension for his disability was treated in light of the motivational factors possibly involved. Those who did not file but continued to come for treatment could be considered as well motivated, unlike those veterans who came only because their attendance insured their pensions. Significantly more in the one to four sessions group did not file, but the other three groups did not differ among themselves to a statistically significant degree, even though the range of incidence of filing was from 68 to 84 per cent. The group which came longest filed fewest applications, looking now at those who came for five or more hours, bearing out the hypothesis that they were best motivated; but the trend does not hold, for the ten to nineteen sessions group should then have had fewer applications than the five to nine sessions veterans. These differences, however, are not significantly greater than chance variation, for the P values of the differences were .30-.05.

A related factor with possible significance for motivation was the referral source of the 575 veterans. Again, the between groups differences were not significant for any of the ten referral sources including self referrals which one might assume would have most significance. About 40 per cent of the veterans were referred by Veteran agencies, the largest single referring source, and self referrals accounted for only 7 per cent of the cases. Approximately a third of the 575 veterans were referred by veterans' organizations and by private hospitals and physicians.

Because of the possible significance of psychologic state in relation to the season of the year, the study of this relationship is interesting. About 40 per cent of the total group of patients were accepted for treatment during the first quarters of the three years studied, a proportion just double that obtaining for the other three quarters of the years. However, of the long term group with twenty or more sessions in therapy, significantly fewer were accepted in winter but significantly more in spring and summer than was observed in the other groups. Nearly three fourths of this long term group were accepted during the midportion of the year (April to September, inclusive) while only 40 per cent of the other three groups fell in this category.

As the veterans moved further in time from the war period, certain differences were seen among the four groups. The long term group came into the picture predominantly in 1947, two out of three of its veterans entering treatment in that year, while in the other three, shorter term therapy groups approximately half had entered treatment the previous year. In 1948 the ten to nineteen sessions group contributed twice as many, proportionally, as the one to nine groups, and four times as many as the long term group.

As the veterans continued in therapy there was more opportunity to bring under treatment other members of their families who were in need of psychiatric assistance. This is seen in the significantly greater proportion of family members treated among the veterans who experienced more than five hours of therapy, and the continuing trend, as the number of sessions mounted, increasing from 28 to 40 per cent, 11 to 23 per cent more than in the one to four sessions group.

The chronology of therapy is continued in the factors of table I which summarize the veteran's contacts with the clinic from the initial contact through termination of his case. Nearly every patient, from 88 to 97 per cent of the various groups, was seen by a psychiatric social worker in his first clinic contact. This was the beginning of the relationship which lasted only a single week for 24 per cent of the 575 veterans studied, but for twenty or more therapeutic sessions for 4 per cent of the total group. Among the groups returning for nineteen or fewer hours, from 19 to 24 per cent came as frequently as weekly or more often, and in the long term group more than half came this frequently. Groups five to nine and ten to nineteen are similar in frequency of treatment and unlike the other two groups except with respect to the one to four group in weekly or more frequent therapy.

Although the long term group came frequently and for many sessions, it also broke more appointments than the other groups, and a third of its members broke five or more scheduled appointments. The ten to nineteen group was similar in being a relatively long term group and also breaking five or more appointments, with one of every four veterans failing to keep this number of appointments. Only 6 per cent of the ten to nineteen group and 12 per cent of the longer term group broke no appointments, a proportion much smaller than the 32 to 43 per cent of the one to nine groups. It is true, of course, as with bringing other family members under treatment, that the longer the therapy continues the more likely it is that there will be others involved and, similarly, there will be more broken appointments. Despite the high incidence of broken appointments in the longer term groups, their members did keep their final appointments in significantly greater proportion than did the one to four and five to nine groups. The longer the veteran came for treatment, the more likely it was that he would keep his final appointment.

It will be recalled that there were intergroup differences with respect to the time of year when therapy was entered. For the total group the proportion of veterans entering treatment varied from 16 to 43 per cent for the four quarters of the year. Time of termination showed much less variation from quarter to quarter, ranging only from 20 to 33 per cent. For the one to four group, winter and spring were the principal seasons of case termination, unlike the five to nine and ten to nineteen

groups for whom spring and fall were the seasons for termination of most cases. The years of termination followed the expected distribution, with increasing numbers of the longer term groups terminating in 1947 and 1948.

One might predict that the long term cases would continue until terminated by the therapist, particularly because the therapeutic relationship appeared intense in terms of frequency of treatment and keeping the final scheduled appointment. This is not, however, supported by the data summarized in the latter part of table I, for there were no significant differences among the four groups and, in all, about half the cases were terminated by the therapist and half by the patient, with the balance slightly in favor of the latter for all groups. This lack of relationship with number of therapeutic hours appears also in the psychiatric status of the veterans at close of treatment, as judged by the therapists. There were no statistically significant differences among the three groups which came for treatment five or more times, although each group had a significantly greater proportion of improved members than group one to four. Perhaps this difference was a function of the severity of illness in the latter group, yet it is the long term, twenty or more sessions group which consistently had larger proportions of its group referred for continuing psychiatric supervision following close of clinic treatment. Again, there appeared no relationship between hours of therapy experienced and psychiatric diagnosis, for about two thirds of all four groups were diagnosed as psychoneurotic, six times the incidence of any other diagnostic category. The ten to nineteen sessions group had significantly more epileptics and mental defectives than the other groups, but the other variations from group to group for the several diagnostic classifications were not greater than chance.

Finally, a second analysis was carried out on the relationship between number of therapy hours and psychiatric status at the close of treatment. The latter factor was selected for further study because it is the basic criterion of psychotherapeutic success. The first analysis of this factor's relationship with number of therapy hours, as reported, showed no significant differences among the three groups which experienced five or more hours of treatment, although all three groups had a significantly greater proportion of their members than the one to four sessions group who were rated by the therapists as improved at the close of the cases. Table 2 summarizes the analysis of the improved and unimproved cases in relation to the number of therapeutic sessions. Of the 352 veterans who were rated as improved at termination of their treatment, 49 per cent had come fewer than five hours. In contrast, 75 per cent of the unimproved cases had come for such a brief series, a significantly greater proportion. These veterans who had from five to nine hours of treatment constituted 29 per cent of the total number who had improved, a proportion double that of the 15 per cent in the unimproved group who had from five to nine hours. Again, in the ten hours and more groups, 22 per cent of the improved had experienced the relatively longer series, while only 10 per cent of the unimproved had continued treatment for the longer series. Thus, more than half of the improved group were in the therapeutic relationship for five hours or more, and only one fourth of the unimproved, a 2 to 1 ratio.

SUMMARY

A sample of 575 male veterans in psychotherapy in a Veterans Administration Mental Hygiene Contract Clinic during the January 1946 to June 1948 interval was studied for various factors and their relationship to the number of therapy hours experienced by the patients. The typical or modal patient seen in the clinic was in his twenties, married, white and ex-Army with from two and one half to three years of service including combat experience. He was other than an only child or oldest or youngest of his siblings, and had been reared in an intact family situation. The veteran had applied for a pension because of his disability, had been referred to the clinic by a Veteran agency, was accepted for treatment in the winter of 1946 after an intake interview by a social worker, was treated less frequently than weekly but more often than monthly, and no other member of his family had been brought under treatment. Once under treatment, he broke no appointments before breaking treatment, therapy was terminated by him rather than by the therapist in the spring of 1947, the therapist noted that the veteran's psychiatric status had not improved but did not note what disposition of the case followed treatment, and the illness was diagnosed as psychoneurosis.

Nearly two thirds (65 per cent) of the 575 veterans came for therapy fewer than five hours, 20 per cent came from five to nine hours, 11 per cent came from ten to nineteen hours, and only 4 per cent came for treatment twenty or more times. Chi-square tests of significance of differences among the four groups for the various factors studied yielded information on significant relationships between patient and therapy variables, and number of therapy hours experienced by the veterans. For various of the four groups these relationships were established for branch of service, birth order, family situation in which the veteran was reared (psychologic milieu), application for pension, season of the year and the year when therapy began, other family members treated, number of appointments broken including the final appointment, psychiatric diagnosis and change in psychiatric status.

Finally, of the 352 veterans who were rated by their therapists as improved psychiatrically at the close of treatment, 49 per cent came fewer than five hours, while 75 per cent of the 223 unimproved veterans came for this brief a period. More than half of the former group were treated five or more times, a proportion twice that of the 25 per cent of the unimproved group who came this often, a 2 to 1 ratio.

Washington University School of Medicine





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(1) Ravdin, I. S., and Gimbel, N. S.: Protein Metabolism in Surgical Patients, J.A.M.A., 144:979 (Nov. 18) 1950.

(2) Vars, H. M., and Gurd, F. N.: Role of Dietary Protein in Experimental Liver Regeneration in Nitrogen Balance Study, Am. J. Physiol., 151:391 (Dec.) 1947.

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Postgraduate Review

STREPTOMYCIN IN THE TREATMENT OF PULMONARY TUBERCULOSIS

SOME GENERAL CONSIDERATIONS

PAUL MURPHY, M.D.
ST. LOUIS

Although the curative powers of streptomycin have fallen far short of the advanced claims made in the more irresponsible articles which have appeared in the lay press, it is by far the most effective agent added to the methods of treating tuberculosis in many years. Five years have passed since this drug first was used in the treatment of tuberculosis in humans and, while much remains to be learned, it is appropriate to summarize present thought and experience with its use for pulmonary tuberculosis. Streptomycin has an important role in the treatment of extrapulmonary tuberculosis but since the pulmonary form of the disease constitutes at least 90 per cent of the problem, it is thought better to restrict considerations to it alone.

It must be realized clearly that there are great difficulties in appraising any and all forms of treatment in pulmonary tuberculosis. Once this disease is established in a patient it may wax and wane throughout the remainder of his life and evaluations of the patient's status are at best crude estimates of the results of the constant interplay between the forces of defense and those of aggression. Neither of these forces can be measured in any manner even approaching accuracy. The capricious behavior of pulmonary tuberculosis often mocks efforts at prognosis. Therefore, in evaluating treatment, one must always be mindful of the unusual possibilities for error in conclusions based on *post hoc ergo propter hoc*. The practice of matching a streptomycin-treated patient with a similar one not receiving the drug is often employed. This plan of study has value but its use is limited by the great difficulties in finding suitable patients to serve as controls. To further complicate the problem of evaluating the effect of streptomycin is the fact that this drug is always used in conjunction with other therapeutic measures which, by themselves, may be responsible for any improvement noted. Another point to be remembered is that at a given moment the forces of defense may be in the ascendancy and would be on the way to complete victory were it not that some insurmountable obstacle, such as a pulmonary cavity, bars the way.

Certain well established facts about streptomycin therapy must receive attention before its value in treating pulmonary tuberculosis can be discussed. The use of this antibiotic is governed and sharply limited by three factors: (1) Its action is suppressive only. (2) The period of effective use is limited by the development of resistant strains of tubercle bacilli. (3) Toxicity limits both the dosage of this drug and the duration of its administration.

Little is known about the action of streptomycin on tubercle bacilli in the tissues of man but most definitely this agent fails to exterminate these organisms. Presumably there is interference with the free proliferation of the bacteria since the action of streptomycin is most effective if it is given at a time when the tubercle bacilli are multiplying rapidly. It is thought that this factor accounts, at least in part, for the drug being most effective against recent pulmonary lesions which are exudative in nature, and of comparatively little value when dealing with chronic fibrotic disease. The administration of streptomycin always is predicated on the basis that after it is discontinued there will still be tubercle bacilli remaining in the body. These living virulent organisms must be handled by other methods of treatment or defense. Tuberculous infection can be restrained, but never eradicated, by streptomycin therapy.

The most disappointing feature about streptomycin in the treatment of tuberculosis is the ability of tubercle bacilli to become resistant to this drug. Comparatively little is known about how this is accomplished. Many investigators believe that tubercle bacilli as they exist in their hosts are of two kinds, those natively resistant and those natively susceptible to the effects of streptomycin. According to this theory resistance comes about by suppression of the susceptible strains leaving the resistant types free to multiply and eventually to dominate the bacterial population. The ability of tubercle bacilli to develop resistance depends on the duration of treatment rather than on the daily dose of streptomycin. According to Tucker[1] the rate for emergence of tubercle bacilli resistant to 10 micrograms per ml. or more after the daily administation of streptomycin is: after thirty days, 20 per cent; after sixty days, 50 per cent; after ninety

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Author's Note: Since April 1950 when this article was received for publication certain changes are taking place in methods of using streptomycin. Para-aminosalicylic acid definitely delays the emergence of strains of tubercle bacilli resistant to streptomycin when these two drugs are given concurrently. Hence, unless intolerance is a contraindication, para-aminosalicylic acid is always given to the patient receiving streptomycin. The daily amount for an adult should be 12 or more grams divided into four or five doses, which are best given with food. In general, the symptoms of intolerance are the common ones encountered with large doses of any salicylic acid compound.

Recent studies carried out by the United States Veterans Administration strongly suggest that 1 gram of streptomycin injected twice a week into a patient receiving para-aminosalicylic acid daily is as good a method of administering streptomycin as any used heretofore for pulmonary tuberculosis. When dealing with either tuberculous meningitis or hematogenous tuberculosis it is still felt best to administer the streptomycin daily.

Implications of the apparent effectiveness of streptomycin therapy, when this drug is given only every few days, are that it is very far reaching. In all likelihood the emergence of resistant strains can be delayed for sufficiently long to solve at least partially this problem which has been so grievously vexing in the past and it would seem that we can broaden appreciably our indications for the use of streptomycin in pulmonary tuberculosis with relative safety from this standpoint. When more definite and detailed information is available it is planned to summarize it in The Journal of the Missouri State Medical Association as a supplement to this report.

days, 62.5 per cent; and after one hundred twenty days, 75 per cent.

Emergence of strains of tubercle bacilli refractive to streptomycin has significance beyond limiting the effective use of this drug. In addition to becoming resistant, tubercle bacilli can actually become streptomycin-dependent and be caused to flourish by its continued use. This presents a danger from the standpoint of public health because if streptomycin-resistant bacilli are transferred to another person and set up disease, this patient cannot be benefited by streptomycin therapy. Theoretically, it should be possible to create a dangerous percentage of tuberculosis carriers who would disseminate streptomycin-resistant strains by the injudicious wide-spread use of this drug. This is more than an academic problem. Consider for example the patient who has had a thoracoplasty and is restored to health except for the fact that the small amount of sputum raised each morning still contains tubercle bacilli. Many of these patients live at home with their families and the temptation is strong to give streptomycin in an effort to convert their sputum. The chances of failure are great and, if it occurs, the patient may then be shedding streptomycin-resistant organisms. This situation will add to the risk already existing for the other members of the household.

Streptomycin may have toxic effects. The acoustic nerve, particularly the vestibular division, the kidneys, and the skin are the principal structures susceptible to damage. Occasionally drug pyrexia occurs. The development of toxicity apparently depends mainly on the average blood level of streptomycin whereas its therapeutic effect appears to be dependent on the peak of the blood levels obtained. Streptomycin toxicity is no longer a major problem since it was found that smaller doses given daily for shorter periods of time are but slightly less effective in the treatment of pulmonary tuberculosis than the long continued larger doses formerly employed. The administration of the daily dose in one or two injections instead of four or more as was done in the past, also has aided in diminishing toxic effects. Except for slight vertigo, toxicity is seldom encountered with treatment regimens now employed.

The results obtained by treating pulmonary tuberculosis with streptomycin depend largely on the type of case selected. When a patient with recent exudative lesions is treated adequately with this drug the results may be quite striking. It is general experience that in this type of case streptomycin causes benefit which is definite in the vast majority of patients. Improvement is more prompt and extensive than could be expected without its use. On the other hand, streptomycin is rather uniformly disappointing in its failure to benefit chronic fibrotic or fibrocavernous types of disease. Occasionally, however, spectacular results are obtained with unexpected closure of cavities. In many such instances it is probable that streptomycin accomplished this through its beneficial action on an endobronchial lesion which had been sustaining a cavity of the tension variety. In other patients showing unanticipated improvement it seems likely that the exudative components had been underestimated grossly and what originally was judged to be predominately a fibrotic type of disease in reality was a mixture of fibrotic and exudative lesions. Pulmonary lesions of the miliary type resulting from hematogenous dissemination will often respond to streptomycin in a dramatic fashion. One has only to see patients acutely ill with massive exudative tuberculosis "cool off" and be brought under at least semicontrol in the matter of a few weeks to realize the value of streptomycin. Likewise the lack of improvement in cases of bilateral fibrocavernous disease—the ones which most need help —will soon convince even the most enthusiastic that it is certainly not a panacea in the treatment of pulmonary tuberculosis.

Second only in importance to the selection of the proper type of case for streptomycin therapy is the necessity to realize that its effect in all likelihood will be only a transient one. Relapse is exceedingly common after it has been discontinued or after a high degree of resistance has developed unless the body's own defenses can carry on unaided, or are assisted by some other measures. This latter consideration is important because perhaps the greatest value of streptomycin is its ability to assist many patients to reach a state in which they are suitable candidates for collapse therapy or even resection surgery. Streptomycin used for this purpose is responsible for saving many patients who otherwise would be doomed. This drug also is making surgical intervention much safer by diminishing the incidence of postoperative spread of tuberculosis. At the present time it is practically the universal custom to use streptomycin as protective coverage for pneumonectomy or lobectomy. If used to prepare patients for thoracoplasty the streptomycin course is often planned so that it may give protection during the stages of operation and for a short time postoperatively. In many of the better risk patients it is not used with this procedure unless there is a postoperative spread of the disease. In general, streptomycin has been disappointing when used for tuberculosis of the pleura but, theoretically, when it is used in conjunction with pneumothorax it should diminish the frequency of pleural complications.

The most important decision pertaining to the use of streptomycin in pulmonary tuberculosis is that of proper timing. In planning its use one must always remember that this antibiotic is apt to be effective only for a comparatively short period of time and, when given in conventional regimens, only one course of treatment can be relied upon for benefit. It clearly follows then that its effective use depends on an accurate appraisal of the long term requirements of treatment. If the physician who first makes the diagnosis yields to family clamor and begins streptomycin at once before the case can be appraised from a long range view, irre-

parable harm may be done. Far too often patients who certainly will require major surgery are streptomycin resistant when they enter the tuberculosis hospital. This is the result of a premature course of streptomycin given to them as soon as they were diagnosed and while they were awaiting admission to the sanatorium. The outlook for many of these patients is not good since they must forego surgery or receive it without the needed protection of streptomycin. The decision to start treatment with this drug is a grave one which demands the vision and skill of a physician with long experience in the overall treatment of pulmonary tuberculosis. It is a sound basic rule to withhold streptomycin in the treatment of this disease if experience indicates that the patient will do well without it. In a disease notorious for relapse it is poor medical strategy to deplete one's reserves unnecessarily or before the conflict is approaching a decisive climax.

Under no circumstances should one try to make streptomycin therapy a substitute for other established methods of treatment. Its role is always an auxiliary one. Occasionally an unfortunate patient is encountered who has been correctly diagnosed as having active pulmonary tuberculosis but was told that he could continue working provided he took streptomycin injections. Whether this advice was given on the basis of unscrupulous cupidity or inexcusable ignorance makes little difference—the results will be equally tragic in the vast majority of cases.

TREATMENT REGIMENS

At the present time 1 gram of streptomycin a day is the usual dose employed in the treatment of pulmonary tuberculosis. It makes little difference whether this is given in one or two intramuscular injections. The number of treatment days is usually much fewer than it was several years ago. For the most part, courses of sixty, forty-two, or even thirty days are employed when the drug is administered daily. With a program of this type streptomycin is given the opportunity to "prime the pump of recovery" without precluding the possibility of more being used again in the future should it be required. Preliminary studies indicate there is value in programs calling for streptomycin every third day and thus prolonging the period during which it exerts effect to three times what it would be if the drug were given daily. Another plan is to give streptomycin for four weeks, stop for an equal period of time and then resume its daily use for another four weeks. Para-aminosalicylic acid is a drug with some bacteriostatic action against the tubercle bacillus. Of greater importance, however, is its ability to delay the emergence of resistant strains when given along with streptomycin in the treatment of tuberculosis. The combined use of these drugs is too recent for accurate evaluation of this effect but preliminary reports indicate that para-aminosalicylic acid can prolong the effective use of streptomycin to a considerable degree. It should not be long before there are definite data in regard to this. The dose of para-aminosalicylic acid is usually 10 or 12 grams daily by mouth. Two grams are given five or six times, usually after the meals and interval feedings, in order to diminish the gastric irritation frequently caused by this drug. Alkalis must be given to many patients receiving para-aminosalicylic acid if they are to tolerate it. In quite a few patients this drug must be stopped because of indigestion or other toxic effects.

STREPTOMYCIN THERAPY FOR THE COMPLICATIONS OF PULMONARY TUBERCULOSIS

The two most frequent complications of phthisis are intestinal tuberculosis and tuberculosis of the larynx. Both conditions can cause painful and distressing symptoms which add greatly to the seriousness of the patient's condition. Diarrhea or dysphagia may interfere greatly with adequate nourishment and prevent improvement in a patient who otherwise would make headway against his disease. Fortunately, some of the most spectacular results of streptomycin therapy in tuberculosis are obtained from its use for these conditions. A short course of the drug frequently suffices to control the serious symptoms of intestinal or laryngeal tuberculosis. From ten to twenty days of treatment often cause definite improvement and enable these patients to take advantage of their food and bed rest. This allows early use of streptomycin for these complications of pulmonary tuberculosis and the brevity of the course insures effective use in the future should the drug be needed again. Endobronchial involvement is so frequently associated with pulmonary tuberculosis that it cannot be considered a complication in the usual sense of the word. When there are clinical manifestations of this condition streptomycin therapy is always indicated. Some of the dramatic improvements from the use of this antibiotic for pulmonary tuberculosis probably are due to its beneficial action on the endobronchial component of this disease.

SUMMARY

Streptomycin is exceedingly valuable in the treatment of pulmonary tuberculosis and its complications provided its limitations are realized and it is given at the most opportune time in the treatment program. Therapy programs are not rigidly standardized but the most common practice is to give 1 gram a day for not more than sixty treatment days. On regimens of this type toxicity is seldom a major problem. There is evidence that para-aminosalicylic acid when given with streptomycin delays the emergence of resistant strains. The most important things to bear in mind when treating pulmonary tuberculosis with streptomycin are that its action is only suppressive, of limited duration, and the drug is always to be used in conjunction with other therapeutic methods of established merit.

539 N. Grand Blvd.

1. Tucker, William B: Evaluation of Streptomycin Regimens in the Treatment of Tuberculosis, Am. Rev. Tuberc. 60:715, 1949.

Have you tried the Aerohalor

in treating **secondary invaders**

of the Common Cold?



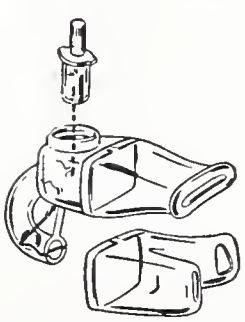
Let us make this point clear at the beginning. We do not recommend penicillin powder inhalation therapy with the AEROHALOR as a cure for the virus cold. It is not. But Krasno and Rhoads[1] have some interesting observations:

"The course of ordinary colds is strikingly shortened by prompt use of the penicillin dust inhalation. We have no illusions that it is effective against virus that initiates the common cold or any other viruses."

The authors also report: "We are fully aware that the etiologic agent of the common cold is probably not a penicillin-sensitive organism. Secondary invaders undoubtedly account for the accentuation of the initial symptoms and in most instances for the more serious complications. Dramatic results often are seen in those patients in whom the cold has been hanging on."

As to the therapeutic effectiveness of inhaled penicillin dust, Krasno and Rhoads state "with assurance" that "bacterial infections of the nasopharynx, para-nasal sinuses, nasal mucosa, larynx and trachea of fairly recent origin, respond well to this form of treatment."

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*Trade Mark for Abbott Sifter Cartridge. AEROHALOR and AEROHALOR Cartridge patented in U. S. and Foreign Countries.

1. Krasno, L., and Rhoads, P. (1949), The Inhalation of Penicillin Dust; Its Proper Role in the Management of Respiratory Infections, Amer. Prac., 11:649, July.

Clinical Conference

CLINICAL PATHOLOGIC CONFERENCE

Ellis Fischel State Cancer Hospital

OTTO SAPHIR, M.D., *Chicago*

Neurofibrosarcoma, Recurrent

History.—(Presented by Milton Kannerstein, M.D., Veterans Hospital, St. Louis). Fifteen years ago a 72 year old white man first noticed a lesion of the lower lip. He consulted his physician and was treated with radium; the diagnosis made at that time is not known. In 1942 he was treated at another hospital with irradiation for a lesion said to be squamous cell carcinoma of the left lower lip. In 1945 this lesion was excised at a third hospital, and the same diagnosis made. In April of 1948 he entered the Veterans Hospital because of a small lump at the site of the scar. Excision was performed and the wound healed promptly. Sections failed to reveal any evidence of neoplasm. There were no palpable nodes in the area of lymphatic drainage.

In June of 1949 the patient returned for follow-up, and a grayish, firm lesion was noted in the midportion of the lower lip which, on biopsy, showed tumor. A V excision of the area was performed together with a bilateral suprahyoid neck dissection. In the resected specimen, on the anterosuperior aspect at approximately the vermilion border, there was a lesion which projected 3 mm. above the adjacent lip surface. The overlying epithelium appeared roughened. Cross section revealed a sharply defined nodule approximately 7 mm. in diameter which appeared to lie beneath the skin and mucosa and to extend into the depths of the lip. Sections of many lymph nodes from the neck dissection showed no metastasis.

DISCUSSION

OTTO SAPHIR, M.D., Chicago: Microscopically, one sees that the derma and subjacent tissues are replaced by a tumor which even at a casual glance appears malignant (fig. 14). It is composed of whorls and fasciculi of cells and delicate fibrils. The pattern varies but in general follows an interlacing and parallel arrangement, oriented in different planes, usually following gentle curves. The fibrils are delicate and wavy except at the margin of the tumor where occasional bands of connective tissue are suggestive of encapsulation. At the periphery interdigitation of cells and fibers can be seen extending into the surrounding subcutaneous tissue and striated muscle with compression, degeneration and, often, complete isolation of muscle fibers.

The cells are elongated with oval, highly pleomorphic, hyperchromatic and, at time, multiple nuclei, the poles of which taper or are slightly rounded. The chromatin is abundant and varies from a reticulated appearance with focal nodularity to irregular clumps. There are usually one or two distinct and prominent nucleoli, although in some areas as many as four are found. Atypical mitoses are numerous and extremely bizarre.

At the periphery are foreign body giant cells with refractile elongated bodies (suture) in their cytoplasm and thick compact bands of fibrous tissue.

Everybody agrees that this is a malignant tumor and, more specifically, a sarcoma. I think the diagnosis of spindle-cell sarcoma is essentially correct, despite the fact that it is only a descriptive term. It is a neurofibrosarcoma but, because of its greater cellularity, may, perhaps, be called a neurogenic sarcoma.

According to the history, this 72-year-old white man first developed a lesion on the lower lip fifteen years ago. The diagnosis is unknown but he was treated with radium so one may assume that it was thought to be malignant. We may be wrong in this assumption. Eight years later he was treated with

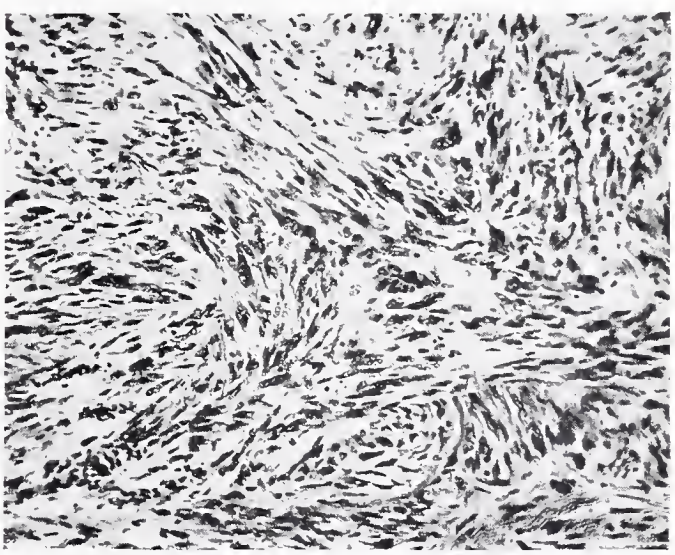


Fig. 14. Note the whorls and fasciculi of cells and the interlacing pattern. Also the tendency towards palisading can be noted.

irradiation for what was called a squamous cell carcinoma of the left lower lip. Three years later a lesion of the left lower lip was again called a squamous cell carcinoma, and it was excised. It recurred at the site of excision and the patient again was seen three years later. There was no evidence of a neoplastic growth. One year later a slowly growing, firm, gray mass was noted in the midportion of the left part of the lip and it was removed together with a suprahyoid dissection. There is no means at the present time of ascertaining the nature of the original lesion, but we can speculate that it might have been at that time either a neurofibroma, a neurofibrosarcoma or a squamous cell carcinoma. If it were a neurofibroma this would now represent a

From the 1950 Tumor Seminar held at the Ellis Fischel State Cancer Hospital, Columbia, conducted by Otto Saphir, M.D., Chicago. The first cases appeared in the January and February issues of THE JOURNAL and the remaining cases will appear in a subsequent issue.

progressive increase in the malignancy, with a number of recurrences. This possibility should be discarded, of course, because the lesion originally was a malignant tumor. If it were a neurofibrosarcoma originally, it would exemplify the known fact of repeated local recurrence of tumors of this sort. It would also explain the fact that the tumor was radioresistant. The tumor had recurred despite irradiation and, in my opinion, this would be more in

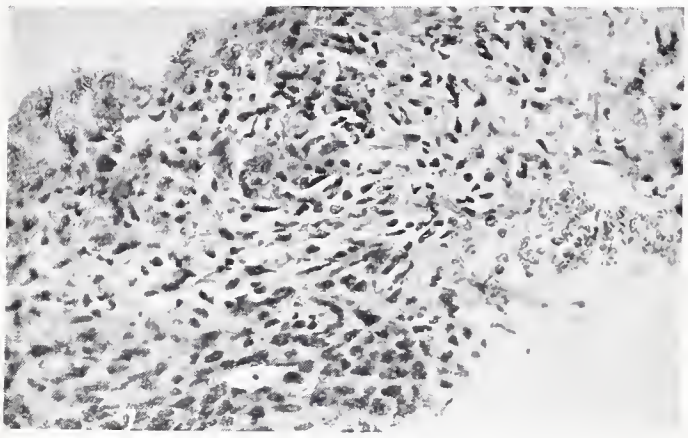


Fig. 15. Note the number of spindle-shaped cells with only very slight tendency towards palisading.

favor of a neurofibrosarcoma than of a carcinoma. Finally, if the original lesion were a squamous cell carcinoma, then the neurofibrosarcoma was entirely secondary and unrelated to the first tumor.

Ever since von Recklinghausen first described the cutaneous lesions of neurofibromatosis, investigators have aligned themselves on one or the other side with regard to the histogenesis of the cells. One theory supported by Masson and a few others maintains that the tumors arise invariably from the cells of the sheath of Schwann. The opposing school, upheld by Mallory, Penfield, Stout and others, believes that they arise from the supporting connective tissue of nerves; namely, the perineurium and the endoneurium. As a result, this latter group considers all those tumors fibrosarcomas and not neurofibrosarcomas. I might mention that in 1948 Stout[1] published an extensive study of fibrosarcomas and described precisely what I consider neurofibrosarcoma. He stated that the rare malignant Schwannomas were confused with the fibrosarcomas because the former were capable of elaborating reticulin. He continues that many malignant fibroblastic tumors may involve nerves secondarily by infiltration, and thus confuse the picture. Masson, on the other hand, stated that recognizable Schwann cells and the typical palisading of tumor cells do not necessarily have to be present in every neurofibroma or neurofibrosarcoma. As you all know, Thannhauser[2] who has also done extensive work on neuromatous tumors of this type, maintained that "whorls of spindle cells if present in the fibrous tissue are indicative of its neurofibromatous origin," because at one time the core was occupied by these cells which then initiated the secondary fibrous process. In other words, he believes that whorls of tumor cells are almost pathognomonic of the neurogenic origin of this tumor; that the connective tissue formation may be a secondary phenomenon.

In one area one can see that the tumor is arranged in the form of parallel fibers. In other areas there is a distinct tendency toward palisading. The tumor was called a carcinoma originally, but one can see that it resembles a sarcoma. In a higher magnification of the same slide the whorling is apparent and the cellularity. On the basis of these findings, I call this tumor a recurrent neurofibrosarcoma. Before discussing these tumors in greater detail, we will continue with the next cases which are somewhat similar.

1. Stout, A. P.: Fibrosarcoma; Malignant Tumor of Fibroblasts. Cancer **1**:30-63, 1948.
2. Thannhauser, S. J.: Neurofibromatosis (von Recklinghausen) and Osteoitis Fibrosa, Cystica Localisata et Disseminata (von Recklinghausen); Study of Common Pathogenesis of Both Diseases. Differentiation Between "Hyperparathyroidism with Generalized Decalcification and Fibrocystic Changes of Skeleton and Osteoitis Fibrosa Cystica Disseminata," Med. **23**: 105-149, 1944.

Immature Neurogenic Sarcoma

History.—(Presented by Mark C. Wheelock, M.D., Passavant Memorial Hospital, Chicago). A 7-day-old infant had a large, red, bleeding, ulcerated area on the back of the left leg, extending from the popliteal space to the ankle. Amputation was done.

DISCUSSSION

Otto Saphir, M.D., Chicago: The section (figs. 15 and 16) contains three separate segments: the

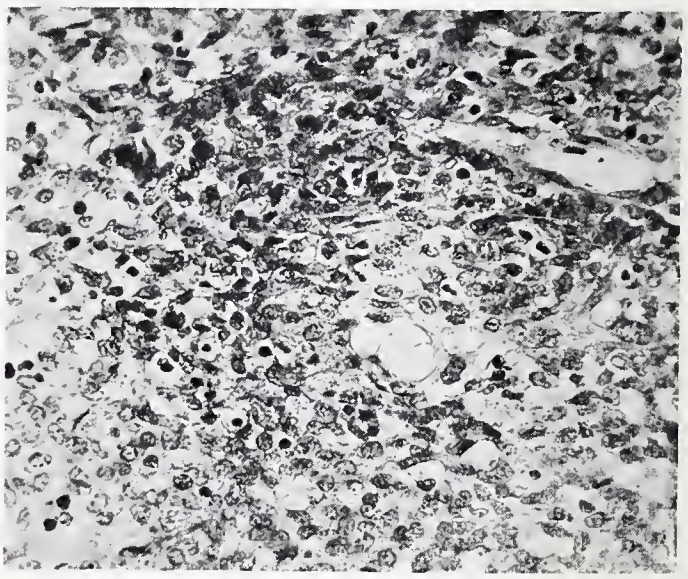


Fig. 16. The nuclei appear slightly more vesicular, but also a tendency towards plexiform arrangement can be noted.

tumor mass, striated muscle infiltrated by tumor and a portion of skin. The tumor is composed of many large spindle and polyhedral cells arranged in a syncytium. A van Gieson stain reveals a paucity of fibrous tissue represented by fine delicate fibrils between the cells. The nuclei are oval or round. The chromatin is reticulated with characteristic beading at the interstices. At times, depending upon the rotation of the nucleus, one to two well defined nucleoli are identified. Despite the uniformity of the cells, slight variation is apparent

on close inspection. Atypical mitotic figures are not rare. Here and there small cystic spaces lined by tumor cells are seen. The greater portion of the tumor has been replaced by a large infarct at the periphery of which there is considerable hemorrhage.

Infiltrating between bundles of isolated striated muscle are tumor cells. The media and adventitia of an artery are likewise infiltrated and in the lumen are tumor cells enmeshed in clumps of fibrin.

A somewhat different lesion is found in the subcutaneous tissue of the skin. It is composed of parallel fibers and cells intertwined to form a fasciculated pattern. The cells are elongated and resemble those seen in the tumor. The nuclei are rounded or elongated with tapering ends.

Decalcified portion of bone also disclosed the presence of tumor.

I am not certain about the nature of this tumor. It is malignant and it is invasive. It was removed from an infant and is apparently a congenital malignant tumor. In my experience, there is nothing more difficult than classifying a congenital malignant tumor. It might be almost anything and, in particular, an angiosarcoma or a neurogenic tumor. As a matter of fact, I called it an immature neurogenic sarcoma arising in soft tissue.

It is composed of immature cells of mesoblastic origin. Differential stains were inconclusive. There were no cellular processes and no distinct stroma. Although I have no definite basis for calling this tumor a neurogenic sarcoma, I do see a few fields in which there is a tendency toward formation of whorls, a palisading of nuclei and areas of a plexiform arrangement of fibers.

The term neurogenic sarcoma was first introduced by Ewing[1] who believed that these tumors all arose from the cells of the sheath of Schwann. Stewart and Copeland[2] agreed with him and stated that, in their opinion, the bulk of tumors called fibrosarcomas were actually neurogenic sarcomas. On the other hand, Stout[3] is the foremost opponent of this concept. He deplores the use of a term which has been applied, indiscriminately, to any spindle-cell tumor. He expressed regret that such an astute morphologist as Shields Warren should state that neurogenic sarcoma is a recognizable entity. Stout subdivides the malignant tumors of the peripheral nerves into two main groups according to histogenesis: (1) those of mesoblastic origin and (2) those of neuroepithelial origin. He believes that most of these tumors are fibrosarcomas and that only a few, with a slightly different morphology, should be called malignant neurofibromas. The fibrosarcomas, he says, are characterized by persistent growth, marked tendency toward recurrence and high radioresistance. Strangely enough, Ewing and others describe identical tumors and make identical remarks as far as radiosensitivity is concerned, but call such tumors of neurogenic origin.

The literature is confusing because such tumors have been called spindle-cell sarcomas, fibrosarcomas, small round cell sarcomas, and other terms. Microscopically, there is great variation. Some are extremely cellular while others are mostly fibrous. Ewing subdivides them into three types: (1) sclerosing neurogenic sarcoma, (2) spindle cell neurosarcoma and (3) cellular anaplastic neurosarcoma. The tumor in this case falls into the third group of Ewing's classification. Nevertheless, I find it difficult to give this tumor a name.

Louis A. Schneider, M.D., Ft. Wayne: I should like to mention that fat stains were negative.

Dr. Saphir: I would call this tumor an immature sarcoma, congenital, and believe that it may be of

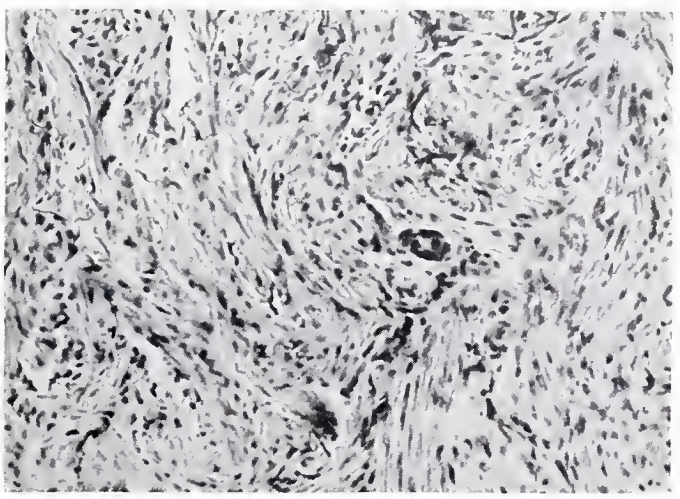


Fig. 17. Subcutaneous neurofibroma. Note the marked plexiform arrangement.

neurogenic origin. The bone and bone marrow also were invaded.

At this point I would like to review our attitude toward such tumors. The genesis is rather perplexing and difficult to comprehend. A neurofibroma is a tumor which is not encapsulated. Although it is morphologically benign, it is slow growing and invasive. When it occurs in the subcutaneous tissues, it often contains in its midst a hair shaft, hair follicle or a sweat gland. The bulk of the tumor consists of coarse, interlacing fibers with a few nuclei. I offer this as one of the differential points between a neurofibroma and a fibroma. In addition, a neurofibroma recurs but a fibroma does not.

A recurrent neurofibroma has the same characteristics as a neurofibroma with the exception of greater cellularity. The cells are spindle-shaped and here and there one sees a tendency toward palisading. Such a tumor should be designated as either a neurofibroma, a recurrent neurofibroma or, principally because of its invasiveness, a neurofibrosarcoma. The term sarcoma is used here to imply that the tumor recurs locally but does not produce metastases. It should be stressed again that the neurofibroma already is invasive and not encapsulated. Therefore, though morphologically benign, it possesses one of the characteristic features of malignancy.

As the cellularity of the recurrent neurofibroma or neurofibrosarcoma increases, we usually call it a neurogenic sarcoma. In our experience the cellu-

larity is related to the invasiveness and ability to metastasize. In other words, we are differentiating between the neurofibrosarcoma and the neurogenic sarcoma. In the former, stroma predominated while, in the latter, stroma is absent. All these tumors are radioresistant. They are different from the Schwannomas or neurilemmomas.

In the next series of slides, I shall demonstrate the gradual transition of a neurofibroma to a neurogenic sarcoma. This slide demonstrates the presence of a sweat gland in the midst of a neurofibroma (fig. 17). In the next slide one sees a recurrence of the preceding neurofibroma (fig. 18). There is much stroma, palisading of the nuclei and a plexiform arrangement of the fibers. The next slide is from the second recurrence one year later. The transformation is quite apparent. There are atypical spindle cells with many tumor giant cells but no fibers. This is a neurogenic sarcoma.

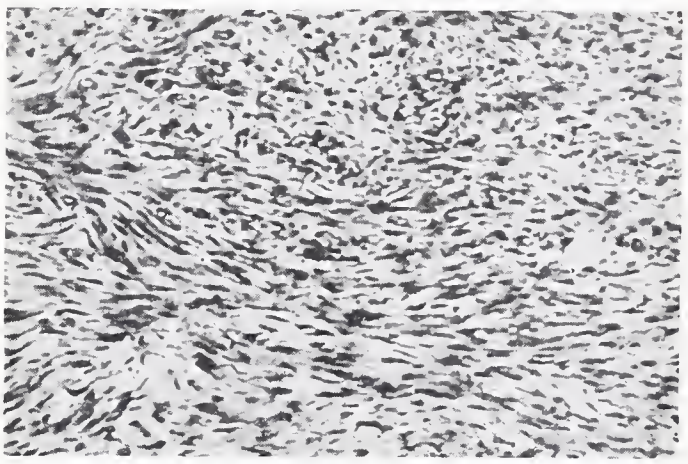


Fig. 18. Recurrence of same tumor.

Dr. Hall, Chambersburg, Pa.: Dr. Saphir, what is the relationship of sclerosing hemangiomas to neurofibromas?

Dr. Saphir: In my opinion a large proportion of sclerosing angiomas are not true angiomas but rather more or less richly vascularized neurofibrosarcomas, or perhaps fibrosarcomas. I am not convinced that the blood vessels are the chief constitutents of the tumor.

Leo Lowbeer, M.D., Tulsa: When would you call a tumor a fibroblastic tumor without reservation?

Dr. Saphir: I consider the following criteria indicative of a fibroblastic tumor: (1) the presence of fibers not in a plexiform arrangement, (2) spindle-shaped nuclei with pointed ends, (3) no invasion and absence of skin appendages within the tumor and (4) suggestive encapsulation.

Dr. Lowbeer: When would you call it a fibrosarcoma?

Dr. Saphir: I would call a tumor a fibrosarcoma if by the van Gieson stain the fibers stained red and there was no particular arrangement of the fibers and nuclei and the tumor is not encapsulated but is invasive.

Dr. Lowbeer: How would you differentiate between a leiomyosarcoma and a neurogenic sarcoma and a neurofibrosarcoma?

Dr. Saphir: The differentiation is not so difficult. The leiomyosarcoma on one hand is found more commonly in the uterus or in the wall of the intestines than in the subcutaneous tissues. By a differential stain by van Gieson the muscle fibers are stained yellow. The nuclei are sausage-shaped with round edges. Tumor giant cells are found more often in muscle tumors than in neurogenic tumors.

Henry Pinkerton, M.D., St. Louis: I was interested in a rather remote and theoretical possibility, particularly because of the presence of two diagnoses of squamous cell carcinoma and a spindle-cell malignant tumor. Several years ago, Taylor transplanted a mouse carcinoma, grown in a fertile egg, into the mouse and obtained a fibrosarcoma. I was inclined to discount this until I had the same experience myself. I had always believed that an epithelial cell could not possibly become a connective tissue cell, although we do know that this phenomenon occurs experimentally. It is unknown whether a malignant change occurs in the stroma with overgrowth of the epithelium or whether some other phenomenon occurs. I would hesitate to say that this tumor maintained the same identity throughout its course. On the other hand, I do think there is a remote possibility that the original diagnosis of spindle-cell carcinoma was correct. There may have been an alteration in the character of the cells with the production of spindle cells.

Dr. Saphir: Your observations propose tantalizing speculations. As you know, spindle cell carcinomas have been described in the skin and in the urinary bladder where transitional cells resemble spindle cells. These tumors have also been called spindle cell sarcomas.

Many years ago Ehrlich transplanted mouse carcinomas and found a sudden transformation into sarcomas. In addition, the literature also contains many examples of carcinosarcomas which, in my opinion, if they exist, are extremely rare. I am certain that you have seen the terms like, "collision tumors," "combination tumors," and "composition tumors." In the "collision tumors" a carcinoma grows into a sarcoma. In a "combination tumor" the stroma of a carcinoma undergoes what is called malignant transformation. Finally, in a "composition tumor" the cell of origin is multipotent and a carcinoma and sarcoma develop in the same area. Experimentally, sarcoma and carcinoma may be produced by the same carcinogenic agent. Often the sarcomatous lesions look like neurogenic sarcomas. I have seen such examples. In this particular case, here, however, it seems unlikely that there were two tumors.

Richard E. Johnson, M.D., Columbia: I would like to say that, first of all, there is no histologic proof available that this man originally had an epidermoid carcinoma of the lip. It was a clinical diagnosis made in 1930, for which he received irradiation therapy. Could it be possible that in preference to the possibility of transition from squa-

mous cell carcinoma to fibrosarcoma, irradiation led to the late development of a fibrosarcoma in the irradiation wound?

DR. SAPHIR: I do not know.

1. Ewing, J.: Neoplastic Diseases, Philadelphia, W. B. Saunders & Co., 1940.
2. Stewart, F. W., and Copeland, M. M.: Neurogenic Sarcoma, Am. J. Cancer **15**:1235-1320, 1931.
3. Stout, A. P.: Fibrosarcoma; Malignant Tumor of Fibroblasts, Cancer **1**:30-63, 1948.

Thymoma

History.—(Presented by Franz Leidler, M.D., City Hospital, St. Louis). On March 28, 1949, this 60 year old white man entered the hospital for treatment of incipient gangrenous change in the left heel. The patient had had gangrene of the right foot with a midthigh amputation performed on December 30, 1948. On physical examination the only pertinent findings were a healed right midthigh stump and a purulent ulcer involving the posterior portion of the left heel. Laboratory findings showed a white blood count of 11,600, red blood count of 3.7, nonprotein nitrogen 24 mg. per cent, sugar 73 mg. per cent, and negative Kahn test and urine. The ulcer on the foot did not respond to therapy. The patient had a cerebral accident on June 17, 1949, with resulting right hemiparesis. He failed to rally following this episode and expired on June 29, 1949. Terminal nonprotein nitrogen was 80.

At autopsy, in the anterior-superior mediastinum in the region of the thymus gland there was a firm mass measuring 7 by 4 by 2 cm. and weighing 40

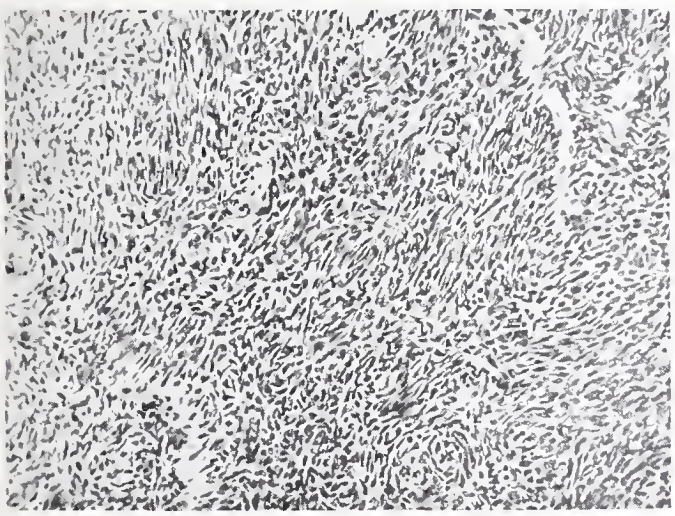


Fig. 19. Most of the tumor consists of this type of cell (thymocytes?).

grams. It was composed of whitish yellow, moderately firm, homogeneous tissue partitioned into numerous lobules varying from 0.5 to 1 cm. in diameter. The entire mass was surrounded by a fibrous capsule.

DISCUSSION

OTTO SAPHIR, M.D., Chicago: The section shows a striking resemblance of the cellular pattern to that of a sarcoma (fig. 19). The tumor is composed of whorls, strands and interlacing bands of oval, polygonal or elongated cells separated by a small amount of stroma, and further subdivided into cellular masses by large amounts of thick fibrous and, at times, hyalinized connective tissue. The variation of the size of the cells seems to be related to the degree of compactness of the cells. The cytoplasm is scanty and fainty acidophilic. The nuclei contain a fine reticulated chromatin. No mitoses are seen. Here and there one is able to discern cysts lined by poorly defined cells resembling those of

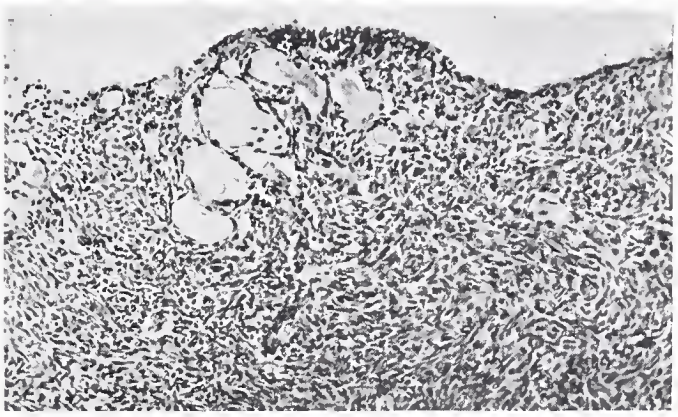


Fig. 20. Note early cyst formation.

the tumor (fig. 20). The cysts contain a homogeneous pink staining material. However, at one margin of the section the cysts contain large vacuolated cells with pyknotic nuclei. Relatively small numbers of lymphocytes (or perhaps these are the so-called "thymic lymphocytes") are scattered among the tumor cells. Rare abortive Hassall's corpuscles can be seen in the tumor. However, in the surrounding fat one can see well defined Hassell's corpuscles (fig. 21).

I think that in this case the safest diagnosis is a thymoma, judging from its position in the anterior and superior mediastinum, its encapsulation and its histologic picture. The latter, in general, is that of a lymphosarcoma. It would be interesting to know whether or not this patient ever had symptoms of myasthenia gravis. This is the type of tumor which commonly is associated with the clinical syndrome of myasthenia gravis.

Tumors of the thymus, in general, have resisted classification for many years. This has been due to the lack of agreement as to the histogenesis of the cells. Two main views have been proposed. On one hand, the small thymic cells are believed to be histogenetically and morphologically related to the blood lymphocytes and, therefore, of mesenchymal origin; the other view maintains that the thymic cells were derived from the entodermal reticulum. Ewing[1] divides thymic tumors into three types: (1) lymphosarcoma or thymoma, composed of diffuse, round, polyhedral and giant cells, (2) carcinoma, arising from the reticulum cells and (3) spindle-cell sarcoma or myxosarcoma. The latter is rare and probably arises from the stroma. He felt that the term thymoma should be used in the same sense as lymphoma.

Symmers[2] presented five types: (1) perithelioma,

which arises around the blood vessels in the thymus, (2) epithelioma, (3) lymphosarcoma, (4) spindle-cell sarcoma, and (5) Hodgkin's granuloma. The most recent classification was given by Lowenhaupt[3] who believed that all the thymic tumors are of epithelial origin. Her classification is as follows: (1) carcinoma of primitive epithelial reticulum, (2) carcinoma of variegated cell pattern (carcinoma of early Hassall's corpuscles, with or without abortive Hassall's corpuscles, (3) carcinoma of granulomatous pattern (carcinoma of late Hassall's corpuscles;



Fig. 21. Note Hassall's corpuscle at the periphery of the tumor.

thymic Hodgkin's disease), (4) carcinoma of thymic round cells, lymphoepithelioma, (5) encapsulated thymoma and (6) carcinoma of adamantinomatous pattern.

I believe that this case falls into the group of encapsulated thymomas. I have seen one example which I thought to be of the adamantinomatous pattern in a patient with a typical picture of myasthenia gravis. I was so interested in the tumor that I sent it to the Registry but none agreed with me. At that time I considered it a teratoma which arose in the region of the thymus with unilateral development, this particularly so because I had found one instance on record of an adamantinoma arising in an ovary. It was thought to be a unilateral development within a teratoma.

This case can also be called a lymphosarcoma. The cells do resemble lymphocytes although originally they were called thymocytes.

In this photomicrograph the pattern of the spindle-shaped cells, the so-called thymocytes, as well as their resemblance to lymphocytes, is evident. There are small cystic structures similar to those often found in thymuses of the newborn. There is a tendency toward the formation of Hassall's corpuscles.

1. Ewing, J.: Neoplastic Diseases, a Treatise on Tumors, Philadelphia, W. B. Saunders Co., 4th ed., 1940.
2. Symmers, D.: Malignant Tumors and Tumor-like Growths of Thymic Region, Ann. Surg. **95**:544-572, 1932.
3. Lowenhaupt, E.: Tumors of the Thymus in Relation to the Epithelial Anlage, Cancer **1**:547-563, 1948.

STUDY INDICATES MANY WARTIME REJECTEES COULD HAVE SERVED

A large number of the 1,992,950 men rejected for military service because of mental and educational deficiency and neuropsychiatric conditions in World War II could have served profitably in some capacity, according to an article in the February 17 *Journal of the American Medical Association.*

In an effort to learn how manpower could better be utilized in a time of all-out emergency, Col. Richard H. Eanes of the Medical Corps, United States Army, and Drs. John R. Egan, Old Saybrook, Conn., and Lionel Jackson, Palo Alto, Calif., authors of the article, made a sample study of 2,054 men who were selected by the national headquarters of Selective Service. All of the men had been rejected for military service at one time for neuropsychiatric reasons but had later served as enlisted men.

Results of their study showed that 1,630 of these, or 79.5 per cent, had rendered satisfactory service while in the armed forces.

According to the article, a number of men in this sample group were borderline mental deficients, based on Army General Classification tests, but served well as truck drivers and in other essential but noncombatant services from twenty to thirty-two months.

The authors added that whether a man turns in a maximum or a minimum job performance in a time of national emergency, he nevertheless has performed a service which has a face value.

The over-all number of rejections for military service, they said, from November 1940 to August 1945 was 6,419,700 out of the 17,954,500 examined, or 35.8 per cent. About 1,992,950, or 31 per cent of those rejected, were turned down primarily for neuropsychiatric reasons.

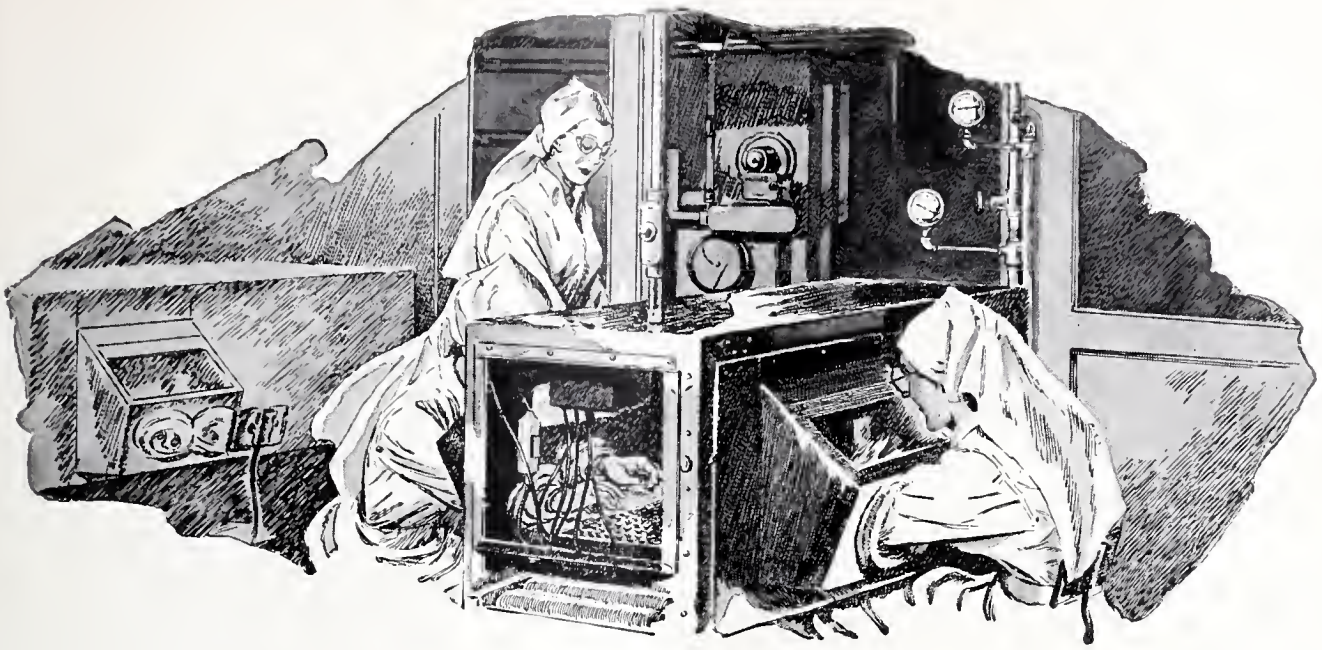
Applying the percentage resulting from their study to the over-all picture, they expressed the opinion that a large number of the 1,992,950 men rejected for neuropsychiatric reasons "would have served profitably in some capacity and would have been discharged honorably and without neuropsychiatric disability."

The article said in part: "It is a common belief that there was a great lack of proper manpower utilization in World War II. . . .

"For a future emergency mobilization, the methods of the past, wherein the examination of a prospective recruit resulted merely in a cataloging of physical attributes, must be revised and some method devised whereby the examination may reflect the recruit's ability to serve. This may be accomplished, at least in part, by perfection of the profile system presently in use. . . .

"Because of the lack of personnel and time, the neuropsychiatric examination, as it was carried out as a part of the process of examining men, was fair to neither the examiner nor the examinee. Some other method must be devised. A definite effort may be made by the Selective Service System to establish, at local board level, a registrant's successes and failures, as he has reacted to civil life, and unless he is definitely psychotic or psychoneurotic to such an extent that he has not been able to adjust to civil life he should be inducted.

"Within the armed forces a determination may be made, under observation, regarding his usefulness. If it is determined that he cannot be used profitably, he should be discharged with no obligation to the government because of so-called possible aggravation."



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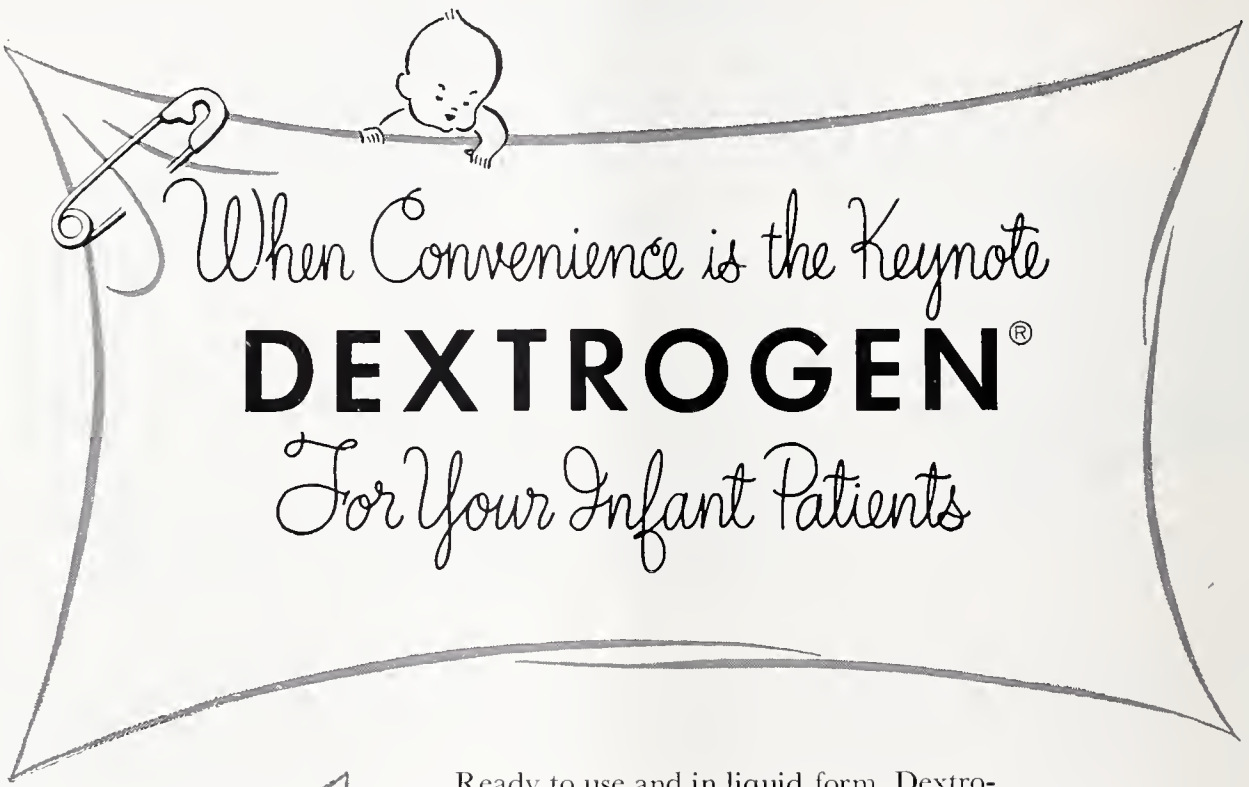
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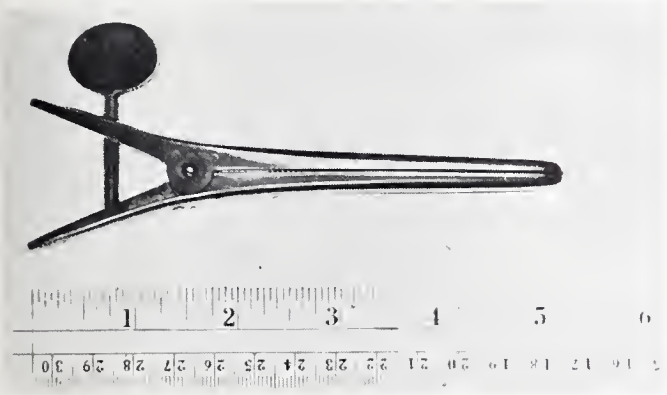
Case Report

COLOSTOMY

AN UNUSUAL COMPLICATION

FRANCIS J. BURNS, M.D.
ST. LOUIS
AND
VINCENT T. HOUSTON, M.D.
ST. LOUIS

VARIOUS TYPES of complications incident to a colostomy have been described in the medical literature. No attempt will be made to recount these reports.



A complication of a colostomy is presented which has not been found reported in the literature.

REPORT OF CASE

E. U., a 71 year old male, entered Firmin Desloge Hospital, St. Louis, on June 27, 1949. For approximately one year prior to that time he had had frequency of bowel movement (five or six times per day), tenesmus, the passage of bright red blood and mucus per rectum. He had had low abdominal cramping pains. He had lost 15 pounds in the three months prior to hospital entrance. His appetite was good.

On digital examination of the rectum, a firm, movable sessile growth with everted edges and central crater was found on the anterior wall of the upper rectum. The tumor was seen readily with an endoscope and a biopsy revealed adenocarcinoma.

His general condition was fairly good. Blood pressure was 150/90.

Laboratory Findings.—Urinalysis was normal; white blood count was 5,850 with normal Schilling; red blood count was 3,560,000 with 11.5 grams of hemoglobin; plasma protein level was 6.03 (A-G ratio 3.46 to 2.57); fasting blood sugar 75; nonprotein nitrogen 35; serology was normal.

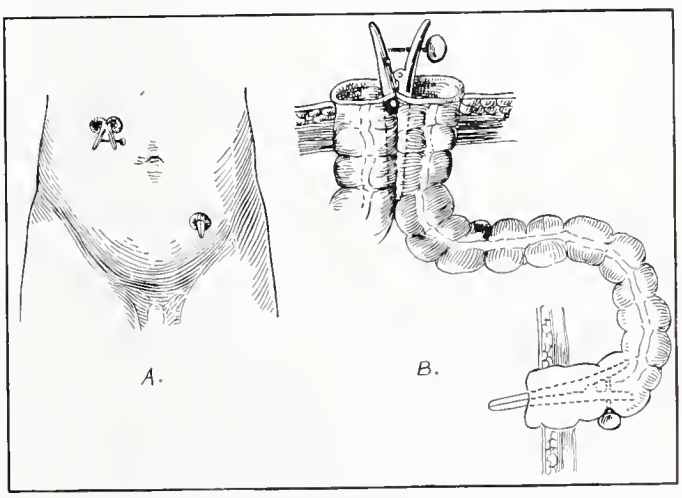
He was prepared for operation with a low residue diet, vitamins, sulfasuxidine and three whole blood transfusions. An x-ray of the chest was normal and a cystometrogram was normal. The preoperative diagnoses were (1) carcinoma of the rectum with partial obstruction, (2) hypertensive cardiovascular disease (compensated).

On July 6 the abdomen was opened under fractional spinal anesthesia. A fairly large, movable tumor was found in the region of the lower pelvic colon and a loop of the upper pelvic colon was adherent to the tumor. No regional or distant lymph nodes were found to be enlarged. The liver surface was smooth. However, the colon proximal to the tumor was obstructed, moderately distended and filled with hard feces to the level of the transverse colon. Because of the obstruction, a colostomy was done, using the proximal portion of the transverse colon, and the lower abdominal wound was closed. The colostomy, a loop type with its two limbs sutured together, was opened the next day and the distal colon was irrigated daily for the following week.

On July 14 a Miles type of proctosigmoidectomy was done under fractional spinal anesthesia. The pathologic report on the specimen removed follows: "The specimen consists of two pieces of large bowel. One has an anus attached, said to be rectum, measuring 13 by 5 by 5 cms. About 6 cms. from the anus there is a hard thickened mass encircling the rectum, having a grayish, gritty surface on cut section. Along the pectinate line there is a firmness of the tissue, associated with ulceration and many dilated internal hemorrhoidal veins.

"The second piece of tissue, about twice the size of the former, consists of a section of large bowel said to be sigmoid. There are two lesions noted: one, ulcerated, measuring 4 cms. in diameter, is cauliflower in appearance; the other, 8 cms. above this, is a fungating mass projecting into the lumen of the bowel and measuring 5 cms. in diameter."

Microscopic examination showed both lesions to be adenocarcinoma, one of the rectum, one of the sigmoid. Invasion of the bowel wall by the tumors was noted but there was no invasion of the regional lymph nodes examined.



(At the time of the resection, the bowel was divided below the level of the more distal tumor because the bulk of the specimen prevented its being placed easily into the pelvis. It was, therefore, removed via the abdomen and the new pelvic floor was thus more easily reconstructed over the distal segment, which was removed via the perineum. This accounts for the specimen being in two parts.)

The obstruction noted at the time of the first operation was most probably caused by the unsuspected tumor in the sigmoid colon.

On July 18 the clamp was removed from the pelvic colon end colostomy and, on July 21, a spur crushing

From the Department of Surgery, St. Louis University School of Medicine.

clamp (fig. 1) was applied to the transverse colostomy. On July 28 the spur clamp was loose, but still attached to the bowel. On July 30 the transverse colostomy was again examined and a wide opening was seen where the spur clamp had cut through. The spur clamp could not be found by any of the personnel connected with the case, but nothing was thought of this at the time. Soon after this the patient began to complain of abdominal pain. On August 6 the distal end or "nose" of the spur clamp was noted to be protruding from the distal end colostomy formed from the pelvic colon (fig. 2A). This was grasped, and the clamp could be moved in the bowel lumen but could not be extracted because of the flared handles and adjusting screw (fig. 1).

On August 8 the patient was again taken to the operating room and, under novocain infiltration and pentothal sodium anesthesia, the clamp was removed from the colostomy. The stoma of the colostomy was split to give a larger opening because it was thought that the stenosis caused by the abdominal skin prevented its being extracted easily. However, it still could not be removed so the operative wound about the colostomy was reopened and the abdomen entered. The adjusting screw of the clamp had perforated the wall of the colostomy loop, just beneath the abdominal wall, and was protruding into the peritoneal cavity (fig. 2B). The offending clamp was then removed, the perforation of the bowel closed, as well as the abdominal wound.

The postoperative course was uneventful, and the transverse colostomy was closed extraperitoneally with novocain infiltration anesthesia on August 17. The patient was discharged from the hospital on August 23.

He has been seen and examined periodically since then, the last time in July 1950. He remains in good health, has gained weight and his appetite is excellent.

4660 Maryland Ave.

CONNECTS LIVER INFLAMMATION TO TATTOOING INFECTION

The belief that hepatitis is being spread by tattooing was advanced today by a doctor associated with the Veterans Administration Hospital, Buffalo, N. Y.

Writing in the November 25 *Journal of the American Medical Association*, Dr. Ballard F. Smith attributed the incidence of that disease among a group of service personnel studied to improper sterilization of the equipment used in tattooing.

Reporting on his study of 26 servicemen under treatment for hepatitis at the Fort Clayton Hospital in the Canal Zone, Dr. Smith said that 18 men (69 per cent) had been tattooed within 49 to 154 days prior to the time symptoms of the disease began to appear.

Of special significance, indicating a possible connection between hepatitis and tattooing, Dr. Smith pointed out, was the fact that 17 of these 18 men had been tattooed at one particular establishment.

As a result of this observation the tattooing techniques were investigated. The reason for Dr. Smith's suspicion that "hepatitis could be transferred from one customer to the next" was brought out in his description of the tattooing procedure used:

"The skin was shaved and washed with alcohol and allowed to dry. Then the stencil of choice was dusted with fingerprint powder and applied to the skin.

"After removal of the stencil the pattern was 'needled in' with from two to four colors. The colors were kept in separate containers. All transfer from the container to the patient was by direct 'dips' of the tattoo needles.

"A tattoo needle consists of a battery of four or five needles in a row, attached to a vibrator. A separate needle battery was used for each color. When the material at the end of the first dip had been used up on the skin, the needle was redipped into the dye container. The process was continued until the pattern was completed.

"Between customers, the needle was wiped with a cotton rag and dipped into a three-ounce alcohol bottle and allowed to dry. When the dye in the working container became depleted more dye was added from the stock bottle. The alcohol bottle likewise was replenished frequently from a larger stock bottle."

Dr. Smith said that the tattooer stated that his work was not satisfactory unless he "drew blood" with the needles. Blood and serum were therefore directly introduced into the dye containers, and it would seem possible that one customer who was a carrier of the hepatitis virus could contaminate all dye containers and the alcohol container as well, the physician added.

As a result of this evidence, certain control measures were put into effect in the Canal Zone area which, according to Dr. Smith, seem "adequate, provided they are religiously followed, to prevent the transfer of serum from one customer to another."

The controls called for the use of individual dye containers, the boiling of containers and needles at least 30 minutes before reuse, and a one-needle battery in place of the four-needle battery.

URGE MORE EXPENDITURES FOR PREVENTION OF BLINDNESS

In 1949 more than $125,000,000 in tax and private funds was spent for care and services to the blind. Money available for research in the blinding eye diseases for the same year was less than $1,000,000. Less than $500,000 was spent for organized prevention services.

This striking contrast between the funds used for aid to the blind and those used for the purpose of prevention and research is brought out by Drs. Walter B. Lancaster, Boston, and Franklin M. Foote, New York, in the January 6 *Journal of the American Medical Association.*

"We should not reduce activities for those already blind," the doctors pointed out, "but by increasing what we are doing now to enable persons to keep their sight we can gradually reduce the number of unnecessarily blind."

The report estimated that about 22,000 people each year have their vision reduced to one tenth of normal vision.

Blindness is a major public health problem, the doctors said, not merely because of its incidence but also because the blind man or woman lives on for many years often partly or wholly dependent on others.

Based on information covering 3,905 children in schools and classes for the blind and 46,537 adults receiving aid to the blind, it is estimated that blindness in all ages is due to infectious diseases in 22.5 per cent of the cases, to injury in 9.3 per cent, poisonings in 0.6 per cent, tumors in 0.9 per cent, general diseases in 5.5 per cent, prenatal origin in 12.2 per cent and causes unknown to science in 29.9 per cent. The remainder are of undetermined or unspecified origin.

Of the blindness resulting from injuries, about half are of occupational origin. The others are due to accidents at play or in the home.

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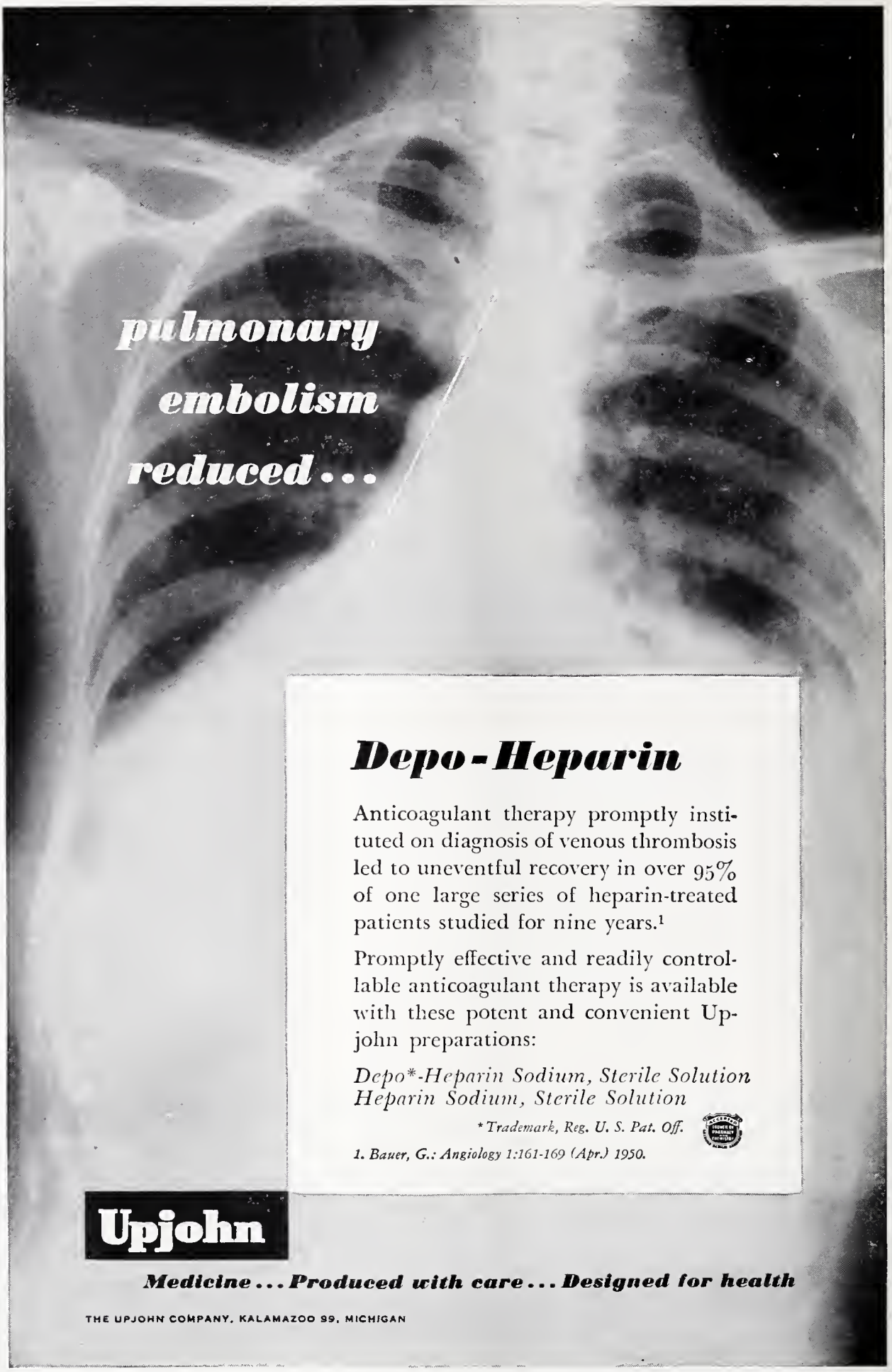
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1. Bauer, G.: Angiology 1:161-169 (Apr.) 1950.

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Special Article

A Four Year Medical School for the University of Missouri

Several surveys and reports have been made dealing with the extension of the Medical School of the University of Missouri to a four year school. The latest survey, which was made for the Board of Curators, together with a report of a committee of the Board appointed to study the survey and a minority report from this committee, is published for the information of members. An editorial on this question appears on page 247 of this issue of THE JOURNAL.

A MEDICAL SCHOOL FOR THE UNIVERSITY OF MISSOURI

A REPORT TO A COMMITTEE OF THE BOARD OF CURATORS

HAROLD S. DIEHL, M.D., Minneapolis, Minn.
Dean of the Medical Sciences, University of Minnesota

Mr. Roscoe Anderson,
Dr. Glenn W. Hendren,
Mr. John Wolpers,

Gentlemen: Pursuant to your request I have given careful study over the past year to the questions upon which you invited my counsel. These questions are:

1. Should the University of Missouri establish a four-year medical school?
2. What programs of instruction should a state university medical school offer?
3. What will be required in staff, facilities and budget for the establishment and support of a first-class medical school?
4. What would be the most advantageous location for such a school in the State of Missouri?

Method of Study

After a preliminary conference with your committee, President Middlebush and Mr. Cowan, I obtained and reviewed the reports, surveys and recommendations which, over the years, have been made concerning the establishment of a medical school by the University of Missouri. I then obtained from the Council on Medical Education and Hospitals of the American Medical Association information concerning the students from Missouri who attend medical schools anywhere in the United States, and from the Bureau of Economics of the American Medical Association data concerning the hospitals, physicians and economic resources of the state.

I also studied the reports of the commission which made recommendations concerning the establishment of medical schools by the University of North Carolina, by the University of Florida and by the University of Alabama.

With this information as background, I visited several strong state university medical schools in the Midwest, selected to represent the alternative situations as to location that confront the University of Missouri in establishing a medical school. From each of these schools I obtained a copy of the current budget to use as a guide in preparing estimates concerning the amount of funds that are required to support a first-class medical school in this area. The schools visited were divided in two groups:

1. Medical schools on the campus with the rest of the university but located in a relatively small community—represented by the University of Iowa, the University of Michigan and the University of Wisconsin.
2. Medical schools located in an urban area, some miles distant from the rest of the university—represented by the University of Colorado, the University of Illinois and the University of Indiana.

In addition, I discussed the location of a possible state university medical school in Missouri with various members of the Council on Medical Education and Hospitals of the American Medical Association and with members of the Executive Council of the Association of American Medical Colleges. I also asked the opinions of a number of other individuals whose experiences would qualify them to have significant judgment upon the question of location. Among these were the Dean and the Professor of Biochemistry of the University of Oregon Medical School; the Dean of the University of Stanford Medical School; the Associate Dean of the University of Rochester Medical School; the Dean of Cornell University Medical School; the Dean of the University of Cincinnati Medical School; the Dean and several members of the faculty of Washington University Medical School; the Superintendent of the University of Minnesota Hospital, the Director of the University of Minnesota's Course in Hospital Administration, and the heads of various departments of the University of Minnesota Medical School.

Finally, I investigated the situations in Columbia and in Kansas City which would be pertinent to the establishment and conduct of a medical school in each location; I talked with the President of the Missouri State Medical Association and the President of the Missouri Academy of General Practice; and I discussed with the Governor of the State and with the Director of the Department of Health and Welfare the possibilities of adequate support for a state university medical school in Missouri.

Type of Report

The report which I am submitting is based on my analysis of available information, my evaluation of opinions expressed and my appraisal of the situations presented. I will not attempt to make decisions for the University of Missouri, for this is obviously the responsibility of the Board of Curators. My report, however, does express definite opinions concerning the desirability of the University of Missouri establishing a medical school, the instructional programs which should be offered and the costs involved. On the question of location I will attempt to summarize objectively

and fairly the conditions which are essential for the establishment of a first-class medical school in either location and to analyze the factors in each location which would be assets in meeting these conditions.

If the Board of Curators decides to recommend that the University establish a medical school, a pamphlet or brochure probably should be prepared to explain to the people of the State and to their representatives in the Legislature the benefits that will accrue to the State from having a medical school and the reasons why the State should provide the necessary funds for its support. My report is not intended to serve this purpose, although it will contain much of the information that would be needed for the preparation of such a pamphlet or brochure.

SHOULD THE UNIVERSITY OF MISSOURI ESTABLISH A COMPLETE MEDICAL SCHOOL?

For many years most states in the Midwest have supported medical schools in connection with their state universities. In fact, Missouri is the only state in this area with population and resources adequate for the support of a state university medical school that does not have one.

Other states which recently have either established or authorized the establishment of medical schools are Washington, Utah, North Carolina, Alabama and Florida. In addition, recent legislative action has resulted in the states of New York, California and Texas supporting two medical schools.

The primary reasons that states support medical schools are to train physicians who will provide medical care for the people of the state and to provide opportunities for young men and women of the state to be educated in medicine and the allied professions. These purposes are accomplished by providing undergraduate medical education, by the training of specialists and by postgraduate medical instruction for physicians in practice so that they may keep abreast of the progress which is constantly being made in the science and the practice of medicine. Closely related to these primary purposes of a medical school are other functions of almost equal importance. Prominent among these are: the conduct of medical research which will extend our knowledge of the prevention and cure of disease; the provision of medical care for thousands of citizens of the state who each year are served in the teaching hospitals and their outpatient departments; and the training of allied professional groups such as nurses, medical technicians, dietitians, physical therapists and occupational therapists.

In these days of world chaos and uncertainty it is impossible to predict the future of institutions—political, social, economic or educational. Yet this much is certain, that come what may, medical education and medical research must continue. Whether this country remains at peace or engages in war, whether we continue as a democracy or resort to some other form of government, whether we hold to the economic principles of capitalism and individual initiative or go farther in the direction of socialism, the health of the individual and of the public must be safeguarded or the situation becomes hopeless. War increases the need for medical and public health services, both for the armed forces and for the civilian population. A breakdown or deterioration of these health services means demoralization. So, whether we are preparing for peace or for war, our country needs to expand and strengthen medical education, medical research, and medical and public health services.

Within the State of Missouri there are two privately supported and controlled medical schools. These are Washington University and St. Louis University, both in the City of St. Louis. Although these schools are located in Missouri, they are not directed primarily to serving the needs of the state. Evidence of this is the fact that during the past two years 63 per cent of the freshmen students admitted to Washington University Medical School and 80 per cent of those admitted to St. Louis University Medical School were residents of states other than Missouri. Furthermore, neither of these schools provides the continuation study programs for the physicians of the state which most state university medical schools accept as one of their important responsibilities.

The University of Missouri, through its two-year program in the basic medical sciences, makes a gesture toward offering the young men and women of Missouri an opportunity to study medicine. For the past several years, this school has accepted each year a freshman medical class of 40 to 45 students, all of whom have been residents of Missouri.

During the same period an average of 55 students a year from the State of Missouri attended the medical schools of Washington University and St. Louis University, while 26 students from the state attended medical schools in other parts of the country. This makes an over-all average of 126 medical students a year from the State of Missouri who gained admission to the medical schools of the United States. As may be seen from Table 1, this is much the smallest number of medical students in relation to population for any state in this area.

Table 1

FRESHMEN MEDICAL STUDENTS PER 100,000 POPULATION IN SELECTED STATES—AVERAGE FOR YEARS 1947-1948 AND 1948-1949*

Missouri	3.3
Illinois	4.4
Iowa	4.9
Minnesota	5.0
Wisconsin	5.1
Kansas	5.1
Louisiana	5.3
Arkansas	5.3
Tennessee	6.3
Colorado	7.2
Nebraska	8.4

Table 1 shows for a group of Midwest states the average number of students per 100,000 population who were accepted to medical schools anywhere in the United States during the academic years 1947-1948 and 1948-1949. From this table it is apparent that the chances of a young man or young woman from Missouri to gain admission to medical school are only about half as good as for residents of Tennessee, Colorado and Nebraska. In other words, Missouri is not offering to its citizens nearly as good opportunities for the study of medicine as those offered by other states in the same general area.

Another and even more important reason that states are interested in developing and supporting medical schools is to provide more and better medical services for the people of rural areas. In recent years fewer physicians have been establishing practices in these areas than the number of rural practitioners lost by death and retirement. To help meet this need several states are establishing and others proposing to estab-

* From Medical Education in the United States and Canada, 1947-1948 and 1948-1949. Published by the American Medical Association.

lish new medical schools. In this connection, however, an important question is: Can new medical schools improve this situation and, if so, under what conditions? Obviously many factors enter into a physician's decision as to where he will practice. The place where he attends medical school, if a factor, is certainly a minor one. Much more important is the place where he serves his hospital internship and/or hospital residency. Teaching hospitals, however, are almost all in urban areas. There seems, therefore, to be little in a medical school or hospital environment to influence a young physician to enter rural practice. What then can be done to increase interest in rural practice? A partial answer to this question is contained in a recent study which shows that over a period of 15 years 58 per cent of the graduates of the University of Minnesota Medical School who have settled in communities of less than 5,000 population grew up in communities of similar size. Analyzing these same data another way shows that 60 per cent of the graduates who grew up in communities of less than 5,000 population returned to practice medicine in communities of similar size, while only 29 per cent of the students who grew up in large cities established practices in rural areas. In other words, the chances are more than twice as great that a medical student who has grown up in a rural community will practice medicine in a rural area than that a medical student who has spent his life in a large city will establish practice in the country. A conclusion that can be drawn from this is that one effective way to increase the number of physicians in rural communities is to increase the number of medical students from rural areas. A state university medical school could do this in Missouri by increasing the opportunities for young men and young women from rural communities to study medicine.

Another value of a state university medical school is that it sets standards of medical practice within the state and assists physicians to practice medicine in accordance with these standards. Private medical schools are an asset but they rarely fill the same roles or render the same services as do state-supported schools. Furthermore, a good medical school is a scientific, cultural and economic asset to a state. From the point of view of need, therefore, it would seem that Missouri should provide and support a first-class medical school. And certainly, the State of Missouri is as well able as most states in the Midwest to do so.

TABLE 2

EFFECTIVE BUYING INCOME OF A GROUP OF MIDWEST STATES FOR 1949*

Illinois	$8,219,271,000
Michigan	6,503,797,000
Missouri	3,763,446,000
Wisconsin	3,440,207,000
Indiana	3,227,880,000
Minnesota	2,901,975,000
Iowa	2,760,073,000
Kansas	1,963,524,000
Colorado	1,418,225,000

The size of the medical school which Missouri should maintain can be smaller than would otherwise be necessary since the medical schools of Washington University and of St. Louis University accept some medical students from and train some physicians for the state. In view of the contribution that these schools make to the state's need for education in medicine, it would seem that a state university medical school would not need to provide facilities for more than 100 students per class. This is a little more than twice the size of the classes currently accepted by the University of Missouri in the two-year school of the basic medical sciences. The suggested increase in class size, however, should not be made until adequate facilities and instructional staff can be provided.

* From *Sales Management*, May 1950.

Should the University of Missouri Continue Its Two-Year School of the Basic Medical Sciences?

When clinical medicine was largely empirical and the basic medical sciences were in their infancy and had but little practical application, the gulf between the so-called preclinical and clinical years of the medical curriculum was so great that it made but little difference whether the preclinical and the clinical years were associated or were separated. In a modern medical school the teaching of the basic medical sciences is closely integrated with the application of these sciences in clinical medicine, and clinical departments are continuously applying the basic sciences in their teaching, research and care of patients. Today, therefore, separation is a distinct handicap both to the basic science department and to the clinical departments of a medical school.

In the best medical schools the faculties in anatomy, physiology, pathology, pharmacology and bacteriology participate with the staffs of the clinical departments in conferences, consultations and co-ordinated instruction. Likewise, the basic medical sciences are most effectively taught when presented in part by clinicians who give the students some concept of the application of these sciences in the practice of medicine. Realizing this, most medical teachers prefer positions in medical schools which have clinical as well as preclinical departments. Lack of clinical contacts, therefore, constitutes a handicap to the two-year preclinical school in the recruitment of faculty.

Another and increasingly difficult problem for the two-year school is the placement of its graduates in other schools for the completion of their medical training. When schools which offered only clinical training, such as Rush Medical College, were in existence, the graduates of the two-year preclinical schools were in demand. However, with the closing of the strictly clinical schools, the possibilities for placement of the graduates of the basic science schools have been limited greatly. In recent years, approximately half of the graduates of the University of Missouri's two-year school have been accepted by Washington University. The others have been scattered, usually singly, among the medical schools of the nation. To accomplish these placements, the dean is required to spend a great deal of time and effort, and frequently to place himself and his university in the embarrassing position of having to appeal to other medical schools to accept Missouri graduates. From the point of view of the student, also, this placement program frequently is unsatisfactory because he may be and frequently is assigned to complete his medical education in a school with which he has no acquaintance and in which he has no interest whatsoever.

Some states which conduct schools of basic medical sciences do not have the clinical resources to develop complete medical schools. On the other hand, it would seem very questionable whether a state such as Missouri, which can provide the resources and support for a complete medical school, is justified in continuing with a limited program of preclinical medical education.

Programs of Instruction Which Should Be Offered in Connection With a State University Medical School

Modern medical services have become far too complex and involved to be rendered by physicians alone. In such services the physician is still the key figure, but he needs the cooperation and assistance of other professional and technical groups. In fact, health has become a teamwork job with physicians, dentists, nurses, pharmacists and technicians of various types all playing essential roles. The instructional services available within a state should, therefore, provide the necessary facilities for the training of personnel in all of these fields.

In the development of such a program the first step to be taken is the establishment of a strong university medical school in association with an adequate teaching hospital. However, since nurses, laboratory and x-ray technicians are essential aides to physicians and are needed in increasing numbers for the new hospitals and medical centers being constructed throughout the state, the initial planning probably should include a School of Nursing and a School or a Course for Medical and X-ray Technologists.

In the Medical School the basic program should be directed toward the training of physicians for the general practice of medicine. This must be kept clearly in view as the primary function of the Medical School. Supplementary to this, however, programs of graduate training in the various specialties of medicine should be established and continuation study courses for the practicing physicians of the State should be organized.

In the field of nursing a state university's primary responsibility should be to provide instructional and training programs which will prepare nurses to serve in instructional and supervisory positions in the hospitals and in the nursing training schools of the state. The training of nurses to meet the service needs of the state can only be met by a multiplicity of nursing schools scattered throughout the state. Only in a university, however, can the teachers and the administrators for these schools be properly trained and advanced training in the special fields of nursing be given effectively. Therefore, if the University of Missouri decides to establish a medical school, a School of Nursing should be affiliated with it.

Medical and x-ray technologists also are essential for the functioning of modern hospitals, clinics and health centers. The responsibilities carried by these technicians require both an adequate training and a high level of ability. Such training is the proper function of a state university which should organize a training program in this field that will lead to a university degree.

Other personnel needed for an effective program of medical care include hospital dietitians, medical social workers, physical therapists and occupational therapists. The experience during and subsequent to World War II demonstrated that an effective program for rehabilitation of the physically handicapped not only reduces hospital occupancy and dependency upon the state, but also can return a large number of individuals to productive occupations in society. Training programs in these several fields should be added as soon as feasible.

Dentistry and pharmacy are professions serving in the health field and closely allied to medicine. Adequate educational facilities for training for these professions should therefore be available within the state. A study of the possible needs for additional training facilities for these professions should be made before final plans for the construction of a medical center are completed. If additional facilities are needed, these can be developed most effectively and economically in association with the Medical School.

Costs of Establishing and Maintaining a a Medical School

A half century or even less ago very little in the way of budget or of facilities was necessary in order to organize a medical school. The basic medical sciences were in their infancy; research laboratories were almost nonexistent; instructional facilities were modest indeed; clinical teaching consisted of lectures and group clinics conducted in whatever hospital happened to be available in the community, and teaching staffs were almost exclusively made up of practicing physicians who devoted part time to teaching and received little or no compensation for their services.

Today the situation is entirely different. The basic medical sciences have developed and expanded so that extensive laboratories, complex equipment and adequate, well-trained staffs are necessary for their teaching. In the clinical fields, still greater changes have occurred. Good medical teaching still emphasizes the art of medicine, but the clinical departments of a modern medical school are constantly applying the developments in medical science. Furthermore, clinical instruction is conducted by having the students during the junior and senior years of the medical course act under close and careful supervision in the role of physicians to the patients in the teaching hospitals and clinics. This type of teaching requires at least a nucleus of full-time teachers in the clinical as well as in the basic science departments. Practicing physicians, if available and qualified as teachers, can make valuable contributions to the training of physicians and may reduce the number of full-time teachers required. In addition, active research in both clinical and basic science departments is essential in a vital, progressive medical school.

Therefore, to provide the facilities and the staff required by a modern medical school requires a substantial initial expenditure and adequate continuing support.

The magnitude of these expenditures in Missouri will depend in part on the location of the school. Basic requirements, however, are essentially the same whether the Medical School be in Columbia or in Kansas City.

Medical School Building

A building for medical teaching and research will be required whether the Medical School is developed in Columbia or in Kansas City and the location will have but little influence upon the type or size of the building required. In Columbia the existing medical school building should be used for other University purposes; therefore, the new building should provide facilities not only for the instruction and research of the various professional groups in the medical and health fields but also for the instruction of certain students from other parts of the campus in some of the basic medical sciences, such as physiology, bacteriology and physiological chemistry. In Kansas City facilities for the instruction of these nonmedical groups would not be necessary but more extensive facilities would be needed for the graduate medical students who would be serv-

ing as residents in Kansas City hospitals affiliated with the Medical School.

This building should provide facilities for the administrative offices of the Medical School, for teaching and research laboratories, for offices and for lecture rooms for both the basic science and the clinical departments, for the medical library, for an art shop, for photographic laboratories, and for an animal hospital.

Although increases beyond the current enrollment of the University's School of the Basic Medical Sciences should be gradual, a new building should provide facilities for 100 medical students per class, for 150 to 200 graduate medical students, for a school of nursing, and for courses in medical and x-ray technology, in hospital dietetics, in physical therapy, in occupational therapy and possibly in dentistry. To meet these needs a building which will contain approximately 3,000,000 cubic feet with some 225,000 square feet of floor space will be required. In planning such a building, however, provision should be made for the expansion that is certain to be required as the school grows and special research and teaching interests develop. Initial construction, of course, will need to provide for a heating plant if the school is built in Kansas City, or for expansion of the University's heating plant if the school is located in Columbia.

At $1.75 per cubic foot, which is the estimate of current costs for the construction and equipment of a building of this type in Minneapolis, $5,250,000 will be needed for the medical building. To this should be added approximately $750,000 for the heating plant and for the special equipment that will be required. Together, this makes a total of $6,000,000 for a building and necessary services for the teaching and research needs of a school of medicine, a school of nursing and courses in medical technology and in physical and occupational therapy. Such a building could also provide the facilities for basic science instruction in a school of dentistry if it should be considered desirable to establish one.

Costs of Constructing a University Hospital and Medical School in Columbia

A medical school needs for clinical teaching an adequate outpatient clinic and at least ten times as many teaching beds as there are students in a medical class. Therefore, a medical school with 100 students per class needs 1,000 teaching beds and an outpatient clinic with approximately 250 patient visits per day. As a general rule, the 1,000 teaching beds should be apportioned approximately as follows: medical service, 250 beds; surgical service, 250 beds; obstetrical service, 100 beds; pediatrics, 100 beds; psychiatry, 75 beds; specialties, 225 beds.

In Columbia, the only existing hospital beds that could be considered satisfactory for undergraduate medical teaching are those in the Ellis Fischel Cancer Hospital and in the Crippled Children's Unit of the University Hospital. University students and patients of private practitioners cannot be utilized satisfactorily for undergraduate medical teaching. These two units could make available about 100 teaching beds. This is approximately the number of beds that should be provided in a university hospital for the private patients of the members of the full-time medical school staff. Therefore, if the Medical School is established in Columbia, it will be necessary to construct a University Hospital of 1,000 beds, as well as an affiliated and adequate outpatient department.

In Missouri, recent costs for the construction and equipment of general hospitals have ranged between approximately $10,000 and $17,000 per bed. The construction and equipment of teaching hospitals, however, are more expensive than of nonteaching hospitals because they must contain not only classrooms, conference rooms and offices for the full-time staff, but also more extensive laboratories and x-ray facilities, as well as a large outpatient department. Therefore, in estimating the costs of construction of a university hospital at Columbia, one should use a figure of $20,000 per bed or a total of $20,000,000 for a 1,000-bed hospital.

In addition, it will be necessary to construct a nurses' residence in which to house not only student nurses and graduate nurses but also certain other hospital personnel as well. Such a residence hall should provide living accommodations for approximately 750 persons. On the basis of current construction costs of $6,000 per person for dormitories in Minneapolis, such a building probably would require approximately $4,500,000.

At a conference April 20, 1950, in Jefferson City with Dr. Buford Hamilton, Director, Missouri Department of Public Health and Welfare, and with Miss Gutchke, Director, Division of Hospital Planning, it was stated that under the State Hospital Plan a University Hospital in Columbia would be eligible for federal aid on a 50 per cent matching basis for the construction of 350 general medical and surgical beds and that federal assistance could be provided also for approximately 100 beds for psychiatric patients, 50 beds for patients with tuberculosis and probably 100 beds for patients with chronic illnesses. This makes a total of approximately 600 beds which, under the current plan, could be considered eligible for construction aid in Columbia. The construction cost of a hospital for 600 beds at $20,000 a bed would be $12,000,000. With federal participation at 50 per cent, this would mean that the University would be eligible to receive toward the construction of the University Hospital $6,000,000 from the State's allotment of federal hospital construction funds. Construction of a residence hall for hospital personnel is eligible to receive federal funds on the same basis. Therefore, federal aid in the amount of about $1,500,000 could be provided toward the construction of a residence hall to serve a hospital of 600 beds. This would make a total of $7,500,000 of federal aid for which a university hospital in Columbia could be considered eligible. This would reduce the net cost to the State for a 1,000-bed university hospital and residence hall from $24,500,000 to $17,000,000. Adding the cost of the medical school building at $6,000,000, this would make a total of $23,000,000 which the State of Missouri would need to supply in order to provide the facilities needed for a 1,000-bed University hospital and for an adequate four-year Medical School and Schools of Nursing, Medical Technology, Physical Therapy and Occupational Therapy in Columbia.

Cost of Establishing a Medical School and University Hospital in Kansas City

The cost of providing a medical school building in Kansas City would be approximately the same as in Columbia. Therefore, the estimate of $6,000,000 for construction and equipment should be applicable for Kansas City as well as for Columbia. Inasmuch as land adjacent to the General Hospital has been offered to the University for the construction of a medical school building in Kansas City, no additional cost for the acquisition of land will need to be added.

The provision of the facilities needed for clinical teaching in Kansas City will be much easier and less expensive than in Columbia. In fact, the Kansas City General Hospital, Mercy Children's Hospital, the new Veterans Administration Hospital and the proposed Mental Health Center will provide adequate teaching beds and outpatient clinical facilities for a medical school of 100 students per class. In spite of this, a medical school needs a hospital of its own. Therefore, if the University of Missouri decides to locate its Medical School in Kansas City, it should construct, in association with the medical school building, a small University Hospital. In view of the other clinical facilities available, a hospital of 250 beds would be adequate in this location. The reasons that the University of Missouri should have its own hospital in Kansas City even though an adequate number of teaching beds are otherwise available, are as follows:

1. It will enable members of the full-time staff of the Medical School to assemble patients in whom they have a special research interest. This is essential if one is to attract first-rate teachers and scholars in the clinical fields.

2. It will make it possible for physicians of the State to refer to the University Medical School patients who present special problems of diagnosis or treatment. The reports by the Medical School to these physicians concerning such patients provide an effective method of postgraduate or continuing medical education for the physicians of the State.

3. It will make it possible for citizens of the State to have the benefit of consultations, when requested by their physicians, with members of the Medical School faculty.

4. It will enable the full-time members of the Medical School faculty to supplement their university salaries by fees from private patients who are referred to them by physicians of the state. Members of the full-time medical faculty should not be in competitive medical practice and the amount of their referred consultation work should be small and limited to the fields of their special interests. On the other hand, it is in the interests of the Medical School, of the physicians of the State and of the public to have available some facilities in a university hospital for private patient care.

The construction of a 250-bed hospital at $20,000 per bed would require $5,000,000. In addition a nurses' residence costing approximately $1,000,000 should be provided.

Dr. Hamilton and Miss Gutchke stated that the construction in Kansas City of a university hospital of 250 beds for general medical and surgical patients would be eligible for assistance from federal hospital construction funds. Since this support is on a 50 per cent basis, $3,000,000 could be obtained from federal funds toward this construction project, leaving $3,000,000 to be provided by the State. Adding to this $6,000,000 as the cost of the medical school building, a total of $9,000,000 would be required from state funds for the construction of a medical school and university hospital in Kansas City.

Resident Hall for Students

Another building that would be a very valuable unit of a medical school or medical center, whether this be in Columbia or in Kansas City, is a residence hall for both undergraduate and graduate medical students. If these students must live scattered about wherever they can find rooms, they cannot profit nearly as much from their educational opportunities as if they have satisfactory living quarters near the Medical School. Such a building should contain accommodations for about 350 single men and 100 married couples. Living quarters for women medical students and for students in medical technology, dietetics, physical therapy and occupational therapy should be provided in the nurses' residence. The cost of constructing such a building would be approximately $3,000,000. Since that would be an income-producing building, if half of the cost were provided by the State, the other half could doubtless be borrowed and the loan liquidated from income.

Costs of Supporting a Medical School

A recent bulletin on medical education states that medical education today is the most expensive field of education because of the special and intricate pedagogic technics needed to train doctors in the personal relationships among doctors, students and patients in the clinical years. More specifically, the following factors combine to raise the cost of medical education:

1. The public and medical profession insist that every prospective physician undergo an intensive period of individual study in classrooms, laboratories and hospitals before he can be allowed to assume the responsibility for the life and health of his fellow man.

2. The training of doctors involves a large number of highly skilled teachers in proportion to the number of students—teachers who must be paid adequate salaries.

3. Medical education requires extensive laboratory facilities of specialized equipment which are costly to secure and to maintain.*

This same report estimates the four-year cost of training a medical student as $13,356. For 100 students per class this would mean a total cost of $1,335,600. Although these figures are based on actual expenditures of certain medical schools in 1946, they are somewhat higher than the amount currently being expended by the medical schools visited in connection with this study. Therefore, it has seemed most logical in estimating the amount of funds that will be required to support a complete state university medical school in Missouri to use as a basis for computations the average amount actually being expended per student by the state university medical schools in Oregon, Iowa, Wisconsin, Michigan, Kansas, Colorado, Illinois and Minnesota (Appendix A).

Since medical school costs, particularly for clinical instruction, are influenced by location, the above schools were divided into two groups—those located in small communities and those located in urban areas —and averages were then computed separately for the basic science departments and for the clinical departments. For the support of the basic science departments the average expenditure is $1,006 per student for the medical schools located in small communities and $840 per student for the medical schools located in urban centers. The greater costs of the basic science departments in the medical schools located in small communities doubtless is due to the fact that since they are on the campus with the rest of the university the departments are carrying a considerable load of instructional services for students in other schools and colleges of the university. Such costs, however, should not be charged to medical education even though they are carried by the medical school budget. Using these figures for a

* From "Medical Education in the United States" published by the National Fund for Medical Education, Inc., March 1, 1950.

school with 400 students, the University of Missouri should provide for the basic science departments a budget of $400,000 if the Medical School is located in Columbia and $335,000 if the school is located in Kansas City.

For clinical departments, instructional costs are uniformly higher in medical schools located in small communities than in schools in urban areas. This is due to the fact that in small communities the medical school must have large staffs in the clinical departments not only for teaching but also to care for the patients in their teaching hospitals; and, since few if any clinical teachers are available in small communities on a part-time volunteer basis, the school must provide this staff on a full-time salaried basis. For the Universities of Iowa, Michigan and Wisconsin, the average cost per student for instruction in the clinical subjects is $1,521 per year. For the Universities of Colorado, Illinois, Kansas, Minnesota and Oregon, the average is $1,052 per student per year. At these rates for a class of 400, $608,000 per year would be required for the clinical departments of a medical school at Columbia and $420,000 for the clinical departments of a medical school in Kansas City.

To these estimates for instructional costs must be added the costs of medical school administration, the library, business and institutional services, medical illustration and photography, the animal hospital, and physical plant maintenance and support. These services will cost an estimated $190,000 in Columbia and $275,000 in Kansas City (table 3).

TABLE 3

ESTIMATES OF GENERAL INSTITUTIONAL AND ADMINISTRATIVE COSTS

Dean's office	$ 35,000
Library	30,000
Instructional services in Kansas City*	20,000
Institutional services in Kansas City*	20,000
Administration of graduate and continuation study programs	20,000
Animal hospital	10,000
Medical illustration and photography	10,000
Plant maintenance and services in Kansas City*	130,000

Adding the costs of basic science instruction, clinical instruction, and general services and facilities, the total budget required for the support of a medical school in Columbia would be $1,198,000 and in Kansas City, $1,030,000. If the tuition were set at $300 per student, income therefrom for 400 students would amount to $120,000 a year. This would leave a net cost to the State of approximately $1,000,000 per year for the support of a state university medical school in Columbia and $900,000 a year for support of a similar school in Kansas City.

Costs of Operating a University Hospital

The current per diem costs of university hospitals in this area are as follows: University of Wisconsin, $13.47; University of Indiana, $13.60; University of Iowa, $14.51; University of Illinois, $14.87; University of Minnesota, $17.56; University of Colorado, $18.00; University of Michigan, $19.25.

The average of these costs is $15.89 per day. Using the figure of $16 per day, the cost of operating a 1,000-bed hospital in Columbia at an average of 80 per cent capacity would be approximately $4,500,000 per year. Of this amount, probably 10 per cent of $450,000 could be anticipated from private patients and an equal amount from so-called part-pay patients; that is, patients who pay their hospital bills but no professional fees. This would leave a total of $3,600,000 to be provided from state or county funds. To this approximately $150,000 would need to be added as the net cost of operating an adequate outpatient clinic.

To operate a university hospital of 250 beds in Kansas City on the basis of these same cost estimates a budget of approximately $1,200,000 per year would be required. Of this probably $200,000 could be collected from private patients and $200,000 from part-pay patients. This would leave a total of $800,000 per year to be provided from state or county funds. In Kansas City only a small outpatient clinic would be needed in connection with a university hospital. This probably could be operated at a net cost of approximately $75,000 per year. This would make a total of approximately $875,000 per year which would be required from state or county funds for the operation of a university hospital and outpatient clinic in Kansas City.

That the above estimates are comparable to the current expenditures of university hospitals in this area is evident from the following data. The University of Michigan's hospital budget for an institution of slightly more than 1,000 beds is $6,560,000, of which approximately $2,360,000 comes from state and county funds. The University of Iowa's current budget for a 700-bed hospital is $3,500,000, of which $2,500,000 is appropriated by the state. The University of Minnesota for a 450-bed hospital has a budget of $2,850,000 of which $1,820,000 comes from state and county funds. And the University of Colorado for a 340-bed hospital has a budget of $2,445,000 of which $1,420,000 is appropriated by the State and approximately $400,000 is provided by counties from which the patients come.

Financing the Care of Indigent Patients in a University Hospital

Patients who are unable to pay their hospital bills are cared for in state university hospitals under three different arrangements.

1. The state pays the entire cost. Under this arrangement the state makes an appropriation to the university hospital to cover the costs of the number of indigent patients which the hospital estimates that it will care for during the year. This is the plan followed in Iowa and in Nebraska. In Iowa after the Legislature has made the appropriation, the University Hospital sets up a quota on a population basis as to the number of patients that each county may send to the hospital during the year. The bills of these patients are paid by the State but the bills of patients beyond the quota are charged to the counties in which the patients reside. This arrangement makes it easy for counties with limited resources to send patients to the University Hospital. On the other hand, it has the disadvantages of requiring large state appropriations and of relieving local communities of responsibility for the medical care of their citizens.

2. The patients' bills are paid by the counties in which they reside. This plan is followed in Indiana and in part in Michigan. In both of these states, legislation provides that the University hospital is reimbursed for the bills of these patients by the state treasurer, who in turn collects from the counties in which the patients reside. This arrangement obviates the necessity for a state appropriation for the university hospital. On the other hand, it places such a heavy financial burden on some of the poorer counties that at times they do not

* In the estimates for Columbia, the cost of instructional services, institutional services and plant maintenance and services is reduced by 50 per cent.

send to the university hospital patients who are urgently in need of hospital care.

3. Patients' bills are paid in part by the state and in part by the counties. This is the plan which is followed in Colorado, Minnesota and Wisconsin. The law in these states provides that the bills of patients who are referred by authorized county officials to the university hospital shall be submitted to the state treasurer who reimburses the university hospital and then charges half of each patient's bill to state funds and half to the county in which the patient resides. Under this plan the state does not make a direct appropriation to the university hospital but instead authorizes the state treasurer to reimburse the university hospital up to a given sum for one-half the cost of the hospital bills of so-called county patients. The plan has the advantage of reducing the financial burden on the local community and yet retaining some local responsibility for the patient's care. This arrangement has proved exceedingly satisfactory in all of the states which use it and it could well prove to be the best plan for Missouri. Some consideration, however, might well be given to an adjustment in charges to the counties in accordance with their ability to pay.

Costs of Related Educational Programs

For the establishment of a School of Nursing on a true university basis, a budget of about $75,000 a year should be provided; for a course in Medical Technology, about $40,000, and for the inauguration of a program of Continuation Medical Education for the physicians of the State, about $25,000.

Support of Research

The research conducted by the staff of a progressive medical school requires substantial support. Fortunately in recent years funds have become available in increasing amounts for the support of such research. Among the major sources of this support are the United States Public Health Service, the American Cancer Society, the National Foundation for Infantile Paralysis, the American Heart Association, various national foundations, local foundations, and private corporations and individuals. From these several sources some medical schools are receiving research grants whose total approximates the operating budget of the medical school.

Capitulation of Construction Costs of University of Missouri Medical School and Medical Center

In Columbia:	
Medical school building	$ 6,000,000
University hospital of 1,000 beds with outpatient department	20,000,000
Residence for nurses and certain other hospital personnel	4,500,000
Total	$30,500,000
Possible grant from federal hospital construction funds	7,500,000
Net cost to state	$23,000,000
Dormitory for medical students, undergraduate and graduate (one-half the cost to be liquidated from income)	1,500,000
Grand total	$24,500,000
In Kansas City:	
Medical school building	$ 6,000,000
University hospital of 250 beds	5,000,000
Residence hall for nurses and certain other hospital personnel	1,000,000
Total	$12,000,000
Possible allotment from state's share of federal hospital construction funds	3,000,000
Net cost to state	$ 9,000,000
Dormitory for medical students, undergraduate and graduate (one-half the cost to be liquidated from income)	1,500,000
Grand total	$10,500,000

In the future certain additional facilities and buildings very probably will be needed for the Medical School or the medical center. These needs are likely to be occasioned by special research activities, by the organization of special institutes such as an institute of industrial hygiene or a rehabilitation center, or by the demand for special schools such as a school of public health. Such facilities, however, should be added gradually and might well come, at least in part, from private contributions.

That these estimates, high though they seem, are conservative rather than excessive is evident from current expenditures of other medical schools for buildings:

1. The University of Washington recently spent $9,000,000 for a medical school building and is seeking $13,500,000 additional for a 450-bed university hospital.

2. The University of California at Los Angeles is spending $15,500,000 for a medical school building to take care of 50 students and a 250-bed university hospital. This university is asking the Legislature of California for an additional $15,000,000 to expand its medical school facilities to accommodate 100 students per class and its university hospital to 500 beds.

3. The University of Minnesota is spending $13,500,000 to improve the facilities of its Medical School and to expand its University Hospital by 250 beds.

Support Required for a University of Missouri Medical School and University Hospital

In Columbia:	
For medical school	$1,000,000
For nursing, medical technology, continuation medical program	140,000
For university hospital and outpatient clinic..	3,750,000
	$4,890,000
In Kansas City:	
For medical school	$ 900,000
For nursing, medical technology, continuation medical program	140,000
For university hospital and outpatient clinic ..	875,000
	$1,915,000

In considering these costs one should realize that they are not just the costs of educating 100 doctors a year, but that they include also the costs of providing the best of medical care for tens of thousands of the citizens of the State, as well as the costs of the training of specialists, of providing instructional opportunities for practicing physicians and programs of professional education for nurses, for dietitians, for medical technologists and for other groups of professional workers in the health field. Furthermore, since the state survey indicates that additional hospital facilities are needed in Missouri, the costs for the construction and operation of a university hospital are costs which the taxpayers of the State will have to meet whether or not a university hospital is constructed. That is, if the needed beds are not provided in a university hospital, they will doubtless be provided in small hospital units scattered throughout the State.

The legislative appropriations to meet the costs summarized above would not need to be available all at the same time. For example, the building costs can be spread over the three or four years that will be required for the planning and construction of the medical school building and the university hospital, while the operating budgets for the medical school and hos-

pital will not be needed until construction of these buildings is completed.

The Location for a State University Medical School in Missouri

Previous considerations concerning the establishment of a medical school by the University of Missouri have placed more emphasis upon the question of location than upon certain other factors that are of far greater importance in the development of a truly first-class medical school. Location is important but only as it contributes to such basic requisites of a good medical school as the following:

1. High standards of medical education of medical research and of medical service.
2. An atmosphere of scholarship and of scientific inquiry permeating the medical school. Such an atmosphere is characteristic of a true university. It is exceedingly important, therefore, that the medical school be and function, not only in name but also in fact, as an integral part of the university. This relationship is just as important, although somewhat more difficult to maintain, if the medical school is located away from the main university campus.
3. Adequate facilities, equipment, clinical material and support both for teaching and for research.
4. An able, active, cooperative and loyal faculty.
5. Effective and forward-looking leadership.
6. A carefully selected and competent student body. The large number of applicants for admission to medical school in Missouri assures a state university medical school of a well-qualified student body.
7. An appreciation on the part of the citizens of the state and of their representatives in the state government and of the Board of Curators of the University as to what constitutes a high-grade medical school and a willingness on the part of these groups to support such a school.

If a university can and will meet these requirements, it can develop a strong medical school in any location. A university environment and an urban community both offer definite advantages to a medical school, and the medical schools that have both are especially fortunate. Most medical schools, however, have had to choose between these alternatives, with results that demonstrate conclusively that it is possible to develop a strong medical school in either situation. For example, the Universities of Iowa, Michigan and Wisconsin have medical schools in small communities associated with their respective universities; while the medical schools of the Universities of California, Columbia, Cornell, Harvard, Illinois, Johns Hopkins, Northwestern, Colorado, Oregon, Kansas, Washington University and Yale are in urban communities separated from the rest of the university. Several of these medical schools, namely Columbia, Johns Hopkins, Washington University and Yale, are in the same city with their parent universities, but from the point of view of intimate functional relationships they might almost as well be many miles apart. In Missouri, therefore, it should be possible to develop a truly first-class university medical school either in Columbia, or in Kansas City. Each location, however, presents certain advantages which should be carefully considered in making the decision as to the location of the school.

The advantages to a medical school of being on the campus with the rest of the university, even though this be a small community, and the advantages of having a medical school in a large city were so well presented at the recent Congress on Medical Education and Licensure by W. R. Berryhill of the University of North Carolina Medical School and Dean Roy R. Kracke of the Medical College of Alabama respectively that copies of their papers are attached as Appendix B and Appendix C.

Columbia as a Location for a State University Medical School

The major advantage of Columbia as a site for the development of a medical school is that the University of Missouri is located there. The spirit of scholarship and scientific progress which is found on the campuses of great universities is distinctly helpful in the development of a strong medical school. In fact, a medical school which is separated from the university must cultivate such an atmosphere within its own walls.

The students and the staff of a medical school on a university campus have easily available splendid cultural and recreational opportunities. If the medical school is separated from the university, these opportunities are lost. They may, however, be adequately replaced by the cultural and other advantages which are available in a large city.

A close association of the medical school with the rest of the university makes possible cooperative research enterprises and facilitates conferences and consultations on individual research problems. The departments of chemistry, physics, biochemistry, zoology, psychology, sociology and veterinary medicine are concerned with scientific problems and employ scientific techniques that are pertinent to the field of medicine.

Administrative practices and procedures are simplified and facilitated if the medical school is on the same campus as the rest of the university.

A medical school on the university campus can provide some instruction in subjects such as bacteriology, physiology, physiological chemistry and anatomy to students in other schools or colleges of the university. However, the amount and the importance of duplication in teaching staff and facilities, if the medical school is in a separate location, is too small to be of much concern. (See Appendix D.) Of more significance is the duplication of such services as the bursar's office, the registrar's office, purchasing and accounting offices and building service and maintenance.

A large university hospital, such as is required for a medical school in a small community, provides a great deal of medical service for the people, particularly the poor people, of the state. According to the State Hospital Survey considerable expansion of such service is needed in Missouri. In fact, in many areas there are no hospitals to which physicians can refer patients who have difficult medical problems and are without financial resources to pay for private medical care. However, in establishing a 1,000-bed university hospital, the State and the University must realize that they are assuming a major and continuing financial responsibility for medical care and that even in a small community even with a large teaching hospital there remains the problem of providing for the medical students adequate experience with certain types of conditions and illnesses. Prominent among these are accidents, contagious diseases, acute illnesses, obstetrics, well baby clinics and community health services.

This problem is well summarized in a recent article on medical education which states "In certain university teaching hospitals the student is not exposed to a sampling of the common illnesses of man. There is a

tendency to admit for study only diagnostic dilemmas. . . . One saw the reaction to this in military service, when many of the young physicians appeared to be bored and impatient with men who suffered from the most common complaints of mankind—headache, backache, bellyache—and felt that they were acting as dignified physicians only when they were presented with evidence of the rarer and more obscure types of diseases. . . . Students are interested in but frequently do not have an opportunity to learn more about the lives of their patients before and after their stay in the hospital, the restrictions enforced by illness and, in a broader sense, the costs of illness, of hospital care and of the services offered by community, state and federal public health programs."*

A practical problem frequently encountered in operating a large hospital in a small community is the difficulty of obtaining the nurses, the technicians and the service personnel required for such an institution.

In addition to the advantages which accrue to a medical school from being on the university campus, there are advantages also to the university in this relationship. Among these are the leadership which the medical school gives in the biological sciences and the prestige that accrues to a university which has a distinguished medical school. Johns Hopkins University is known primarily for its medical school and the prestige of Harvard, Columbia, Washington University and others is enhanced by their distinguished medical schools.

Furthermore, a medical school and university hospital touch the lives of the citizens of the state as do few other units of the university. For this reason a fine medical school and university hospital can become excellent channels of public relations for the university.

A university which owns all, or essentially all, of the hospital facilities which it needs for teaching never need be concerned with possible divergent or conflicting interests on the part of the staff, management or trustees of teaching hospitals which are not completely under university control.

Columbia, as the geographic center of the State should, theoretically at least, provide an ideal location for a large state hospital. On the other hand the advantages of a central location are reduced if there are transportation difficulties and the normal flow of business and population traffic is in another direction. The University of Iowa and the University of Indiana have their university hospitals in the approximate center of the state. Conversely the University hospitals in Minnesota and in Kansas are near the eastern borders of their respective states; the University of Illinois hospital is in Chicago and the University of Michigan hospital in the southeastern corner of that state.

In view of limited transportation facilities into Columbia, it might be necessary in order to operate a 1,000-bed hospital there to develop a statewide ambulance service similar to the one which is maintained by the University of Iowa Hospital.† Furthermore, to have an outpatient service in Columbia large enough to be of any teaching value, some sort of housing for the patients of the outpatient clinics would need to be provided.

In Columbia the Ellis Fischel State Cancer Hospital and the Crippled Children's Service of the University Hospital could be assets to a medical school provided that the State Cancer Hospital were placed under university control.

Kansas City as a Location for a State University Medical School

While Columbia offers to a medical school the advantage of being on the campus with the rest of the university, Kansas City offers the advantages of a large metropolitan area. Most important among these advantages are the extensive clinical facilities immediately available to the medical school for both undergraduate and graduate medical instruction. These facilities include the Kansas City General Hospital with 550 beds for white patients and 269 beds for colored patients, an outpatient department of this hospital with approximately 60,000 patient visits per year, the Kansas City Tuberculosis Hospital of 235 beds, Mercy Children's Hospital with 145 beds for the care of charity patients, the Veterans Administration Hospital which is under construction and will provide 500 beds for the care of general medical and surgical patients, and the recently authorized Mental Health Center with a psychiatric clinic for both adults and children and a Psychiatric Receiving Hospital of 100 beds.

The Kansas City General Hospital, which has been offered to the University for a teaching hospital, ranks well among municipal hospitals of the country; in fact, it is a surprisingly good institution for a hospital without university affiliation. The University of Kansas Medical School sends senior medical students to this hospital for a few clinics but has no effective association with it. Under the contract which Kansas City has offered to the University of Missouri, the professional services of this hospital and its outpatient department would be completely under the control of the Medical School. A comparison of this contract with contracts between other medical schools and municipally supported teaching hospitals shows it to be very satisfactory to the medical school. In addition, Mayor Kemp stated that if there are any aspects of the contract which are not satisfactory to the Board of Curators, the Kansas City authorities will be glad to modify them. It has been stated, also, that the entire medical staff of the hospital has offered to resign if the Medical School takes over this hospital for teaching purposes, thereby giving the Medical School complete freedom in the selection and appointment of its teaching staff.

Mayor Kemp further stated that he anticipates and is certain that the city will be prepared to meet certain increases in operating costs of the hospital if it is utilized for teaching. Such costs, he said, will be amply justified by the improvements which will result in the hospital from a medical school affiliation.

For the teaching of pediatrics, the Mercy Children's Hospital would be a splendid supplement to the children's service of the Kansas City General Hospital. The Chairman of the Board of Trustees of this hospital has stated that he is certain that a medical school could count upon the complete cooperation of this hospital in its teaching and research programs. It would be desirable to agree upon the details of this cooperation before final decision as to the location of the school is made.

The 500-bed Veterans Administration Hospital, which

* Romano, John: "Basic Orientation and Education of the Medical Student," J. A. M. A. 143:409-412 (June 3) 1950.

† In 1947 the twenty State University of Iowa Hospital Ambulances transported 23,673 indigent patients to and from the 99 Iowa counties and travelled a total of 1,559,229 miles during the year.

is under construction in Kansas City approximately four miles from the Kansas City General Hospital, will provide additional facilities for both graduate and undergraduate teaching. The Veterans Administration would be not only willing but anxious to give to a state university medical school in Kansas City responsibility for the educational and medical service programs of the hospital. The experience of other medical schools with similar Veterans Administration hospitals indicate that these hospitals can be a great asset to undergraduate medical instruction as well as to graduate residency programs.

The Mental Health Center and 100-bed Psychiatric Receiving Hospital, which is to be built in the near future adjacent to the Kansas City General Hospital, will provide excellent facilities and staff for the training of medical students, of physicians and of specialists in psychiatry.

Municipal hospitals in large urban areas make available for teaching purposes patients with certain illnesses and emergency conditions that are seen only rarely or in small numbers in hospitals, even large university hospitals, in small communities. An active outpatient department associated with a general hospital in a large city also is a great asset for medical teaching. In fact, some types of medical teaching are best done in an outpatient department. It is here that medical students get experience with the types of patients that physicians ordinarily see in an office practice.

Another advantage of having a teaching hospital in an urban community such as Kansas City is that a considerable number of able and interested physicians are available to serve as clinical teachers in the medical school on a volunteer part-time basis. Such teachers cannot devote the time to teaching that is required of those who carry the major responsibility for the modern clerkship type of instruction. On the other hand, having had experience in the practice of medicine, such teachers are able to make a valuable contribution to the training of medical students.

Extensive hospital facilities such as are available in Kansas City also offer a splendid opportunity to a medical school to assume leadership in the development of graduate training programs in various specialties of medicine. Such leadership is clearly one of the responsibilities of a state university medical school. Furthermore, when a medical school is in a metropolitan area, some of the graduates of these programs are able and glad during the years that they are building their practices to render valuable service on a part-time basis in the University's teaching and research programs. As such young men become increasingly busy with their private practices, they tend to reduce the amount of time that they devote to medical school activities, but as this occurs, their places are taken by subsequent graduates.

The offer of Kansas City to provide the University with ground adjacent to the Kansas City General Hospital for the construction of a medical school increases immensely the value of the Kansas City location. The amount of ground provided, however, should be sufficient not only for a building for the medical school and university hospital, but also for the construction of residence halls for nurses and for medical students, and for possible future expansion both of the medical school and of the hospital.

A recently emphasized responsibility of a state university medical school is to provide continuation study programs for the physicians of the state. Experience has shown that it is easier to develop such programs in urban areas than in small communities. Among the reasons for this is that in a large city clinical facilities are more extensive, hotel accommodations are better and the teaching programs can be shared by the part-time clinical staff of the medical school. Medical schools in a small community with exclusively full-time teaching staffs find it exceedingly difficult and burdensome to conduct continuation study programs in addition to their responsibilities for undergraduate medical teaching, for research and for the medical care of the patients in their large university hospitals.

A state is naturally and properly expected to provide the basic requirements and support of its university medical school. However, the difference between a good medical school and a truly distinguished one frequently depends upon support for its activities beyond that which can be supplied by its basic budget. Such support may be for buildings, for special laboratories and equipment, for the support of research, for the development of special institutions, for training programs such as industrial hygiene and public health, or for the endowment of special professorships. The possibilities of obtaining gifts and bequests for such purpose are much better in an urban community than they are in a small town. The University of Minnesota has received from private donors considerable sums for hospital buildings, for the support of medical research, and for the endowment of professorships, and most of these gifts and bequests have come from the residents of the City of Minneapolis in which the Medical School is situated.

A medical school which is separated from the main body of the university must make a very special effort to keep strong and effective ties with its university. This requires even stronger leadership in the medical school than would be necessary if the school were on the university campus.

It requires more effort also to keep it clear in the minds of everyone that the medical school belongs to the university and not to professional or other interested groups in the city in which it is located.

Résumé of Considerations Concerning Location of Medical School

Some medical educators feel that the advantages of having a medical school on the campus with the rest of the university are of such importance that they should outweigh all other considerations and that medical schools should be located in association with their universities without regard to costs or to the other problems involved. Other leaders in medical education are convinced that the advantages of having a medical school in a metropolitan area far outweigh the disadvantages of separation from the university.

In spite of such positive opinions the medical schools of this country offer conclusive evidence that it is possible to have good medical schools in either situation. For Missouri this means that if essential requirements can be met it should be possible to develop a strong medical school either in Columbia or in Kansas City.

In deciding upon the location of the medical school, however, it is essential that the costs and the problems inherent in each situation be frankly and realistically faced, even though not all of these costs will need to be met at the same time. It is vitally important also that the choice be made in terms of what is best for the medical school and the state over a period of fifty

or one hundred years, and not what is currently the cheapest or most expedient. Likewise, it would be a major calamity to have the decision be made on any basis other than an objective appraisal of the situation without regard to past controversies or to pressures or political influence that may seem to be operative at the present time. The current generation of university officials and of the various other groups interested in the location of the school will soon be gone, while the medical school once established will doubtless continue as long as the university exists.

SUMMARY

1. In Missouri there is a definite need for a state university medical school; and a state with the resources and the prestige of Missouri should insist upon a medical school that will rank with the best in the nation. The late president of the University of Minnesota, Dr. Lotus D. Coffman, said "There are certain things in life which we pay for whether we have them or not." He was referring to education in general, but his statement is particularly true of medical education and medical care. If a state fails to train physicians and other medical and health personnel, and if it fails to provide facilities for good medical and hospital care, the citizens of the state eventually will pay, and pay dearly for these failures not only in dollars but also in terms of illness, disability and dependency.

2. A state university medical school should provide not only for the undergraduate education of physicians but also for the training of specialists and for the continuing education of physicians in practice. A state university should provide also for the training of such auxiliary medical personnel as nurses, medical technicians, x-ray technicians, dietitians, physical therapists and occupational therapists. If dentists and pharmacists are needed, it should provide also for their professional educations.

3. It would be folly to start a medical school without adequate funds for the construction, equipment and support not only of the medical school but also of its university hospital. It is estimated that the cost of the State of Missouri for construction of a medical school, university hospital, nurses' residence and student dormitory in Columbia would amount to $24,500,000 and in Kansas City to $10,500,000. The annual support from public funds—that is, from state and county sources—that will be required to maintain a medical school in Columbia is $1,140,000, with an additional $3,750,000 being required for the support of a university teaching hospital; similar costs in Kansas City will amount to approximately $1,040,000 for a medical school and $875,000 for a university hospital. A considerable portion of these costs, however, particularly in Columbia, should be charged not to medical education, but to the medical care of the less fortunate citizens of the state.

Experience in other states suggests that it might be advantageous, for a few years at least, to present a special budget to the Legislature for the support of the medical school and the university hospital rather than to incorporate these new requests into the general university budget. Of course, appropriations for the support of the medical school and university hospital will not be needed until the medical school building and university hospital have been completed.

4. For the development of a strong medical school, it is essential that the school be recognized and function as an integral part of the university. Special interests, sectionalism or politics must not be permitted to influence its development, its policies or its operation. The interest, understanding and support of private citizens and of lay and professional groups is desirable and necessary, but the university *must direct and control its medical school.*

5. Columbia and Kansas City each present definite advantages for the development of medical school. It is essential that these be carefully appraised in arriving at a decision as to location of a state university medical school in Missouri.

APPENDIX A

INSTRUCTIONAL BUDGET PER STUDENT IN CERTAIN STATE UNIVERSITY MEDICAL SCHOOLS*

Table 6

I. MEDICAL SCHOOLS IN RELATIVELY SMALL COMMUNITIES

School	*Basic Science Departments*	*Clinical Departments*
1	$ 931	$1,646
2	1,098	1,462
3	989	1,454
Average	$1,006	$1,521

II. MEDICAL SCHOOLS IN LARGE CITIES

School	*Basic Science Departments*	*Clinical Departments*
4	$ 983	$ 621
5	756	1,415
6	858	1,186
7	764	985
Average	$ 840	$1 052

APPENDIX B

CONSIDERATIONS IN FAVOR OF LOCATING A MEDICAL SCHOOL ON A UNIVERSITY CAMPUS BY W. R. BERRYHILL, DEAN, UNIVERSITY OF NORTH CAROLINA SCHOOL OF MEDICINE, CHAPEL HILL, NORTH CAROLINA.

In this country the great majority of medical schools have developed in population centers, in most part for the very practical reason that access to the wards and clinics of existing hospitals and utilization of the outstanding practitioners of the area provided the only or certainly the most economical means of financing the undertaking. Because of economic and transportation difficulties existing at the time it was easier to bring students to a concentration of charity patients than the reverse.

Before the development of the scientific era in medicine there was little if any appreciation of the importance of the close affiliation of the medical school with a university or of the need for faculties having a primary interest in teaching and research, with the result that often when a university sponsored a medical school in the same large city the two might be miles apart in location and still further apart in educational policies, relations, and standards. Many of the older medical schools at the time of their founding had at best only a speaking acquaintance and not too cordial at that with the university whose name they bore and under whose aegis they functioned.

* The medical schools represented in this tabulation are those of the Universities of Colorado, Illinois, Iowa, Michigan, Minnesota, Oregon and Wisconsin.

So firm was the belief that a medical school could not successfully perform its function away from a large concentration of population that some universities located in smaller communities developed their medical schools in large cities at varying distances from the campus of the parent institution. A few universities, however, placed by historical accident in small towns had the temerity to develop a medical school and a university hospital on their own campuses either because it was recognized that medicine belonged in the university or because no completely satisfactory arrangements could be worked out in larger cities within the state.

Through the years each arrangement has had advantages and disadvantages. Each school has attempted to work out its difficulties and to solve its problems by capitalizing on or supplementing the local conditions. In each type of organization there have developed some great schools.

If medicine is in truth a learned profession and not a trade and if it has finally become, after a long and somewhat devious course, a university discipline, then it is logical to believe that a school of medicine whenever possible should be an integral part of a university—physically and spiritually.

I assume that today most of us who are concerned with medical education would agree that the university campus is the ideal location for a medical school provided adequate funds are available (a) to insure modern physical facilities for laboratories—teaching and research, hospital clinics and awards, (b) to secure a faculty of a high order of excellence, (c) provided patients sufficient in number and in variety of types of illness can be assured for a sound teaching program, and (d) provided the faculty and administration in addition to scientific and clinical accomplishments have an awareness of the mission of a modern medical school and of its importance in the total life of the community.

For a university fortunately located in a large city there should be no problem, but the question arises whether these requirements can be successfully and adequately met on a university campus when located at a distance from a large population center, and whether the educational advantages of close university association outweigh the disadvantages of a smaller concentration of population. This problem is of more than academic interest—in fact, it becomes one of serious concern in view of its importance in determining the location and hence the future adequateness and effectiveness of new or expanded medical schools now being planned as a part of several state universities. It may be of importance also in view of the possible eventual necessity of decentralization of large urban facilities as a result of the world situation which now faces us.

I have been asked to present one point of view on the basis of the decision made by the Administration and Board of Trustees of the University of North Carolina after a comprehensive study. During the past five years several excellent surveys dealing with this problem have been made in Missouri, Florida, Mississippi, and North Carolina, and since I have neither original nor profound thoughts to add to these studies it may be helpful to restate as a summary some of the more important considerations, elementary to this audience perhaps, but it is well to remember that elementary principles are so often fundamental and just as often overlooked or disregarded.

Educational Advantages in the Training of the Modern Doctor in a University Environment

It is axiomatic that progress in medicine is dependent upon close association with the basic sciences which serve as its foundations. This has perhaps been best stated by Dr. Alan Gregg in the report on the University of Missouri Survey of Medical Education, "the growing fringe, the advancing frontier, of medical science may safely be assumed to be dependent upon contact with the natural sciences—indeed contact is too weak a word—coalescence would better describe the relationship"[1] and "the physics and chemistry of today become the physiology and pathology of tomorrow and the clinical medicine of the day following."[2] A scientific environment which would permit and encourage such a coalescence cannot be provided easily or adequately away from close physical relationship with the total scientific resources of a university and its departments of physics, chemistry, biology, psychology, mathematics, and anthropology, and certainly not without staggering cost and duplication which no institution can afford at the present time.

In medicine today, to quote from Dr. Vernon Lippard's Florida survey, "departmental barriers and the barriers between students and faculty are being broken down and it is not unusual to find a medical student, a graduate student in chemistry, biology, or physics, a physiologist, and a surgeon studying a common problem."[3] This helpful and hopeful trend can certainly be furthered more efficiently and economically when the school of medicine is in the university.

In his *The University at the Crossroads*, Dr. Henry Sigerist comments, "we still need, more than ever, a scientific physician well trained in laboratory and clinic. But we need more: we need a social physician who, conscious of developments, conscious of the social functions of medicine, considers himself in the service of society."[4] Intimate contact with the humanities and the social science departments in a modern university, therefore, is likewise vitally important to the advancement of medicine and has been too long neglected in the training of the present day physician. An understanding of the importance of the social and economic factors which influence the distribution of medical care to the people and a recognition that "the progress of medicine is dependent also upon the prevailing attitudes of society toward disease and health, toward our economic and material resources, prevalent interpretations of the role of government and the structure of our society"[5] are perhaps as important to the welfare and success of the future doctor as his understanding of the sciences. He is the person whose obligation and opportunity it becomes to aid medicine in its adjustment to its changing environment and responsibilities. In this perhaps of all times "free and easy access to the humanities and the social studies which a modern university affords"[6] should be available to the medical student during his professional training and to the medical faculty as well.

1. The Board of Curators Report on the University of Missouri Survey of Medical Education. 1945. p. 12.
2. *Ibid.*: p. 25.
3. Education for the Health Services in the State of Florida. State Board of Education and State Board of Control. 1949. p. 13.
4. Sigerist, E. E.: The University at the Crossroads. Schuman, New York, 1946.
5. The Board of Curators Report on the University of Missouri Survey of Medical Education. 1945. p. 12.
6. *Ibid.*: p. 12.

There are definite educational advantages in the class interrelationships between the medical school and the other professional schools of the university with Public Health, Dentistry, and Pharmacy in the medical area and professional schools in the non-medical area—the Graduate School and the Schools of Engineering, Law, Agriculture, Business and Public Administration, Social Work, Library Science, and Education. The importance of cooperative research and graduate training programs between the graduate school departments of the natural and physical sciences and the medical school should be emphasized. The relationships with other professional schools "are of practical significance in the development of special curricula within the university for emergent fields auxiliary to medicine, for such vocations as laboratory technology, dietetics, medical record library service, physical therapy, occupational therapy, hospital administration, medical social worker, and clinical psychologist."[7] A corps of professionally minded people in various fields who are able to work together on projects in the university are thus more likely to form a basis for future cooperation in attacking problems—medical, social, and economic—outside the university that affect the welfare of the community.

Two other advantages should be mentioned here: (1) the easy accessibility to the resources of a large university library is invaluable to the medical school, both educationally and administratively; (2) a close working arrangement with an active extension service, maintained as a part of the educational program of most state universities, provides important support for the medical school in its postgraduate program. By utilizing an existing university organization the medical school is enabled more effectively and more economically to extend its postgraduate training, both extra- and intra-mural, and its services throughout the state.

The Administrative Advantages

There are advantages from the standpoint of the overall university administration in having the medical school and hospital on the university campus. The centralization of administration, of accounting, of purchasing, and of maintenance and servicing organizations lessens duplication of departments and staff and lowers the cost of servicing, maintenance, and administrative supervision, and promotes economy of operation throughout. In the opinion of Dr. Alan Gregg again, "all administration of the university officers is weakened and retarded by separating the medical faculty from the rest of the university."[8]

University standards are more easily maintained and the medical school enjoys more freedom from "pressure groups"—medical and other—when it remains physically a part of the parent institution. A prominent medical educator recently stated, "I know of no medical school in a large city which, within my memory, has not had at least one serious quarrel between the university and powerful and privileged professional leaders in the city. Unless your university medical leaders are resigned to offering teaching positions in return for support and collaboration of clinicians with few other claims to attention, they may well prepare themselves for a decade of pressures and political maneuvers. Usually if appointments are made quid pro quo and at a distance from the university the character of the school depends on forces only slightly under its control."[9]

The location of the medical school on a university campus in a small community demands in large measure a full-time faculty—at least in the geographical sense. From the standpoint of developing a sound educational and research program this is advantageous and such an arrangement furthermore promotes a closely knit organization and an esprit de corps perhaps more difficult to achieve under other arrangements.

With emphasis on teaching and research and with an adequate salary scale from the university, supplemented from a limited consulting practice with a definite ceiling on total income, a university environment becomes an added inducement in attracting and holding a competent faculty.

Another asset to the clinical teaching if the medical school is on the campus is the utilization of the student health service of the university. As pointed out by Dr. Lippard, "increasing interest in the prevention of disease and periodic health examinations make auxiliary facilities of this type highly desirable for instruction of medical students who, in the large city hospital, are so overwhelmed with seriously ill patients that they often lose sight of healthy people and the main illnesses which will make up a large proportion of their practices."[10]

The medical school must control an adequate supply of clinical material for a satisfactory educational program both for undergraduates and for graduates. While for the most part it is possible to have such control if the medical school is separated from the university, either in the same large city area or in a different city, nevertheless all too often the teaching services in hospitals under such an arrangement do not have the security or the freedom inherent in a hospital owned by the university and located on its campus.

Disadvantages

While strong educational and administrative arguments can be advanced for the university campus location it should be recognized that when the university is in a small town there are two disadvantages or handicaps, to overcome which provisions must be made:

1. There is the problem of providing an adequate supply of clinical material with a sufficient variety of disease states to insure a well-rounded teaching program. To many doctors and medical educators accustomed to teaching hospitals and clinics in large population centers it would seem very difficult, if not impossible, to secure abundant clinical material in a small town. Many think in terms of an older concept that the students have to be taken to the patients. Before twentieth century roads and modern transportation facilities were developed this was a more forceful argument than in 1950. Fortunately, most universities in small towns are now located amidst a network of good roads. Nearly everybody today has access to automobile transportation, and presently air transport of patients to and from medical centers will still further simplify and facilitate free and easy mobility of our population. Actually patients from rural areas or towns can now travel 30 to 50 miles to a hospital

7. *Ibid.*: p. 14.
8. *Ibid.*: p. 25.
9. *Ibid.*
10. Education for the Health Services in the State of Florida, State Board of Education and State Board of Control, 1949, p. 20.

in a small university town about as easily and as quickly and with less physical and emotional fatigue than they can from one end of a large metropolitan area to another. From the Florida Survey the following statement is pertinent, "Among those not intimately acquainted with medical education, there is a tendency to relate excellence of instruction to the number of patients a student sees or the number of physicians on the faculty rather than how carefully the patients are studied or how much time and interest members of the faculty devote to teaching and research. It is our opinion that a large population and a large number of part-time instructors are not essential to the development of a good educational program."

The experience of medical schools in small communities has not indicated that they are handicapped seriously by lack of patients. If adequate facilities are provided and a superior faculty assembled, people find their way to the medical center in numbers and with a variety of illnesses more than sufficient to supply material for clinical observation.[11] The experiences in this country at the Universities of Iowa, Virginia, Michigan, Wisconsin, Duke, Bowman Gray, and at the Mayo Clinic at Rochester have over the years borne out the truth of this statement.

It should be kept in mind also that with the spread of prepaid hospital and medical care insurance all teaching institutions must in the future look for a broadened economic basis from which to draw teaching material if they are to continue even their present size classes. Experiments are under way in some institutions in using private patients for undergraduate teaching and present indications are that such an arrangement can be successful. This practice will almost certainly come to be commonplace in the near future as the indigent patient of the medical school days of 25 to 50 years ago is replaced by the part-pay or full-pay patient.

The argument has been advanced that the clinical material available for a teaching hospital in a small town is likely to be limited in certain fields, particularly in obstetrics, pediatrics, and acute traumatic surgery. In certain locations in the past, in the early days of the operation of the university hospital, this has been true. But this handicap is frequently a blessing in disguise because compensation can be and has been made for any shortage of clinical material through affiliation of the university hospital and medical school with special or general hospitals in neighboring centers of larger population. There are mutual advantages and opportunities in such an arrangement in that hospitals in other areas and competent part-time teachers are brought into the university's sphere of influence and additional clinical facilities and material are made available for undergraduate and graduate medical training. The level of medical care in such affiliated institutions is usually elevated to the benefit of the general public, perhaps an even more important consideration than furnishing teaching material for the medical students.

2. A second handicap to the location of a medical school in a small center of population is the lack of readily available qualified part-time clinical teachers in the medical and surgical specialties. We all recognize that this group of teachers are invaluable to medical schools, indeed if it were not for their services perhaps a great many of the schools would be forced to close. We recognize also that this group of able and faithful teachers perhaps never or seldom receive from the medical school the rewards or recognition, academic or financial, that they merit. At the same time it is unfortunately true that some medical schools have been forced to depend too largely upon voluntary clinical instructors, over whom by the very nature of the local situation the institution exercises little control.

There are few university medical schools located in small towns that are not close enough to larger centers of population to avail themselves of the services of qualified part-time clinical instructors. In such a situation the university can exercise more freedom in its choice of part-time staff and has a larger measure of control over it. Furthermore, these men, within a radius of 30 to 50 miles, are just as easily accessible to the university hospital as are some of their professional counterparts in the large metropolitan areas who may live an equal distance from and travel through more congested traffic to the hospital for their clinic or teaching duties.

The Factors Influencing the University of North Carolina Decision

For many years the University of North Carolina has been confronted with the problem of how and where medical education should be developed. In fact, its Board of Trustees in 1846 first approved the establishment of a department of medicine. Since 1879 the first two years of medicine have been taught on the campus at Chapel Hill.

Beginning in 1944 as a part of a statewide popular movement to improve medical care and hospital facilities within the State, predating the passage of the Federal Hospital Construction Act, the University Trustees again faced the problem of fully developing the medical school, this time as a State University Medical Center in the capacity of the focal point in a program of hospital and medical service expansion. The question of the location of the school was studied and the medical and hospital needs of the entire State surveyed by a Commission of 50 prominent citizens. Subsequently a committee headed by Dr. W. T. Sanger, President of the Medical College of Virginia, reviewed the findings and the majority recommended that the school be expanded on the University campus in Chapel Hill provided "that the school of medicine and associated services of the medical center—i.e., a school of nursing, a program for training essential personnel in fields ancillary to rendering medical and hospital care, the existing School of Public Health, an active program for graduate and postgraduate education for physicians and allied medical personnel, arrangements to provide hospitals with clinical and laboratory consultations—be integrated effectively and continuously with the hospitals and health centers in the area in so far as these volunteer to cooperate, and that full utilization be made of the facilities of the voluntary, non-profit hospitals of the State."[12]

This philosophy of the role of the Medical School as the heart of a state university medical center taking the lead with the cooperation of and active participation by the other schools in the State in integrating medical education at all levels with medical and hospital services in those hospitals which wish to become affiliated with the teaching institutions of the area has

11. *Ibid.*: p. 18.

12. Final Report of the National Committee for the Medical Survey, North Carolina Medical Care Commission, 1946, pp. 1-2.

guided the thinking and planning of the University in the development of its medical program and that of the State in its hospital building program. With this background and this concept of the function and place of its medical school in relation to the overall medical care and hospital program in North Carolina, the University Administration and Board of Trustees, and the State Legislature without a dissenting vote, accepted the report of the Survey Committee to expand the Medical School on the campus of the University at Chapel Hill for the following reasons:

1. Those already enumerated as educational and administrative advantages for such a location.

2. The University already had an investment in a modern medical science building and a 100-bed hospital, both constructed in the preceding seven years, which represented a replacement value of approximately $1,750,000 to $2,000,000.

3. There are no large cities in North Carolina and no possible medical school location in the whole State sufficient in size to supply all the clinical material necessary from within its local environs. Furthermore, a University hospital constructed at Chapel Hill would admit patients from all sections of the State on a basis of equality. Such a condition would be much less likely to prevail if the hospital were located in a larger community which might reasonably expect more favorable consideration for its own citizens in return for such contributions as that particular city or county had made to the State.

4. In the larger cities hospital facilities were not available to the University comparable in size or suitability for teaching and research purposes to those which the State Legislature had shown a willingness to provide funds to build on the University campus. Nor could the University secure that control of any hospital in the larger cities which its Trustees deemed essential to assure a sound teaching program. Many existing hospitals offered their facilities to the University "as far as practicable," but this did not seem a sufficient guarantee in perpetuity of a workable arrangement.

Probably the most important reasons for the final decision to place the Medical Center on the University campus lay in (a) the position of the University in the State and (b) the role envisioned for the Medical School in the State Medical Care Program.

From its beginning as a provision in the first State Constitution in 1776 the University of North Carolina has been in a real sense an institution of the people of the State, yet withal singularly free from political influences and pressures. I believe it would be fair to say that the University is more than the geographical center to the people of North Carolina.

The Trustees felt that the support, both in terms of Legislative appropriation and endowment from private sources, would in the long run be greater if the Medical School remained in Chapel Hill where traditionally for over 150 years public and private support have been given and service and leadership expected and accepted than if it were operated as an isolated unit in a larger city of the State.

The Factors Involved in Such a Location

Construction has begun on a 400-bed hospital and outpatient clinic building, to be followed within the next few months by a 100-bed tuberculosis unit, buildings for nurses and resident staff, and an expansion of the present Medical Science Building. It is anticipated that within a year a 50- to 100-bed psychiatric wing will be added as the teaching and research unit of the State mental hospital program.

Chapel Hill is a small community of 10,000 permanent residents and the University has a student body of 7,000. It is located in a thickly populated section of North Carolina. Within a radius of fifty miles there are approximately 900,000 people. A network of good roads, bus lines, together with railroad and air transport, provide easy accessibility from all parts of the State and from central Virginia and South Carolina as well.

Negotiations are being completed for affiliations with two general hospitals totalling approximately 800 beds within an hour's drive of the University. These are intended to provide permanent arrangements for undergraduate and graduate training and represent the beginning of a program that looks to wider affiliations for educational and service functions. Within this area also are two mental hospitals with a capacity of 4,000 patients in which the University Medical School already has charge of the pathology service and which can be utilized for other teaching activities.

There are available in larger cities—within easy commuting distance—capable men for part-time clinical instructions in the University Hospital.

In summary, through such an arrangement as has been outlined we believe it is possible for a medical school as an integral part of a university, even though it is located in a small community, to have all the educational advantages available in such an environment —administrative, scientific, humanistic, and cultural— and at the same time to secure maximal results in its medical training program both in its own hospital and by the utilization of the facilities and the well trained potential teaching talent in other hospitals of the region.

APPENDIX C

CONSIDERATIONS OF LOCATING A MEDICAL SCHOOL IN A METROPOLITAN AREA BY ROY R. KRACKE, DEAN, MEDICAL COLLEGE OF ALABAMA, BIRMINGHAM, ALABAMA, FEB. 6, 1950.

For many years there has been controversial discussion with respect to the location of medical schools. Each time a new medical school is established those responsible for its establishment usually receive advice both for and against the metropolitan and the campus locations. The ultimate decision is usually based on the amount of money available for construction of the physical plant and whether or not the institution can afford to own and operate a teaching hospital on a university campus. If adequate funds are available, the school is usually located in a campus situation; otherwise, the institution must, by necessity, move to a metropolitan area where it can obtain its clinical material from a source being supported and maintained by some other agency or unit of government. Large sums of money are usually necessary to develop medical teaching centers on campus locations. The construction of 250 hospital beds requires a minimum of $2,500,000 capital outlay, in addition to the cost of educational facilities. Even 250 beds are hardly adequate for a well-rounded teaching program.

Five years ago the University of Alabama was confronted with this problem; that is, whether or not to locate its newly authorized medical school in a metropolitan area of the State, such as Birmingham with its population of 400,000, or on the University campus at Tuscaloosa with its population of 50,000. Vigorous arguments were presented by national authorities in favor

of both types of locations. The final decision, however, by necessity, was made purely on economic grounds. The State of Alabama was not able to construct or to maintain a state-wide hospital charity service on its University campus. On the other hand, the State was able to provide necessary funds for the building of a medical school provided, however, that the capital outlay for necessary teaching hospitals could be borne by some other governmental unit. During these five years we have had considerable opportunity to observe the advantages and disadvantages of such a location, but in this paper I will present those factors considered to be advantages of our location in a metropolitan area.

One important advantage of location in a metropolitan area is the vast amount of clinical material that is usually available for teaching, not only at the undergraduate but at the postgraduate level. For example, the students participate in the management of an extremely large volume of obstetrics. The average graduate of The Medical College of Alabama delivers himself approximately 40 women in the hospital by the time he graduates from school, in addition to having delivered from 5 to 10 others on a Home Delivery Service. This, of course, is done under proper conditions of supervision and instruction. Furthermore, the students have ample opportunity to study a wide range of acute infectious and contagious diseases, which are not so readily available in a more chronic hospital as is usually seen on the campus. Also, in addition to our own rather large Pediatric Service, we maintain teaching affiliations with the Children's Hospital of Birmingham, which adds another large mass of clinical material in that field. In our institution we maintain an extremely active Accident and Emergency Service which is responsible for the care of approximately 90 per cent of all accidents that occur in the Birmingham area. During 1949, 51,000 people were treated on this service—an average of one every ten minutes night and day. Our undergraduate students, as well as the postgraduate students, perform tours of duty on this service. Thus, at the time of graduation, practically all of our students have had considerable practical instruction and experience in the performance of many minor operative procedures.

At the time of graduation, our students are better qualified to practice medicine than if their training had been received in a more isolated campus situation. Besides learning the principles of the practice of medicine, they also learn a considerable number of technics that they will have to utilize later in their practice. Furthermore, when a large volume of clinical material is present, there is usually a wide variety of clinical conditions on the Inpatient Service so that students acquire a broad experience in the wards.

A second very important consideration in favor of a metropolitan location is the availability of large numbers of competent physicians to serve on the faculty of the school. Thus, at this time The Medical College of Alabama has approximately 180 physicians on its voluntary teaching faculty. I wish to emphasize that this large group of teachers can be provided in addition to a substantial staff of part-time and full-time faculty in the key positions in the school. It is of considerable importance that a large voluntary faculty be available because they are often able to present a great many important factors in the practice of medicine that are sometimes overlooked by a purely full-time group. Furthermore, a large voluntary teaching staff usually incorporates a considerable number of specialists in the more highly specialized fields that are usually not found in a more isolated campus situation.

Students who are taught by a group of full-time men, part-time men, and a large number of voluntary faculty, and who have opportunity to study a large volume of clinical material, tend to be trained more toward the lines of general practice, rather than toward specialization. There seems to be general agreement that what this country needs in medicine more than anything else today are more general practitioners and fewer specialists. It follows, therefore, that an institution whose pattern of training is directed toward the training of general practitioners can do best under the conditions that are usually found in a large metropolitan area. In a more isolated campus situation, I believe it is true that there is a greater tendency towards specialization, long-time postgraduate study, and more emphasis on the didactic side of medicine than is usually found in the metropolitan school. The student who has been in contact with a large amount of clinical material under the direction of large groups of practitioners should require less hospital training than the student who has not seen such service during his undergraduate days.

As stated before, one of the important considerations in determining the location of a medical school is the amount of capital funds available for the construction of hospital facilities and upon the prospects of maintaining those facilities in the years to come. One often hears the argument that it is better for a medical college to be located on the university campus where it can own its teaching hospital and not be forced to utilize institutions that are owned and operated by other agencies. It is well known, of course, that if a medical school is forced to utilize hospitals owned and operated by other agencies, conflicts of a serious nature may easily develop. However, as we have demonstrated, it is entirely possible for the institution to be located in a metropolitan area and to own and operate its own teaching hospital in that area. That is the situation now prevailing at The Medical College of Alabama, where we own and operate our own 600-bed teaching hospital that services not only large groups of indigent patients, but also private paying patients, with our students having an opportunity to work with both groups. The advantages of this are obvious. It is true that we were fortunate to secure our teaching hospital by gift from the county, but it is easy to convince the people that a medical school can operate a hospital more successfully than any political group.

It is true that this desirable type of situation may be difficult to achieve in a metropolitan area, but I believe the question should be raised, assuming that an institution is able to build a teaching hospital in either a campus situation or metropolitan area, whether it would not be better to build its own teaching hospital in a large city.

It is often stated that one of the advantages of a campus location is the opportunity for close and intimate association of medical college faculty and student body with other units of a large university operation. During my own experience in this type of medical education, which included some 18 years at Emory University where the preclinical years of the school were located on the University campus, I have had ample opportunity to observe these advantages and, in my opinion, they are vastly overrated. It has been my impression that the medical school faculty usually is found to be a detached and separate group on the average univer-

sity campus and does not participate too freely in general university activities. The fact that the professor of anatomy may live next door to the professor of philosophy may be a nice social advantage, but the association stops at about that point. On the contrary, such close association may only serve to accentuate the fact that the former receives a higher salary than does his colleague. Furthermore, such associations are not lost if the medical college is located in a metropolitan area because in practically all metropolitan areas there are universities of one type or another in addition to various research institutes which, of course, are readily available for contact by medical college faculties. It has been my impression that the main advantages of the medical school being located on the university campus, so far as the faculty is concerned, are the opportunities for so-called cultural and educational contacts and for university education of their children.

At The Medical College of Alabama we have had the opportunity to observe the effects of the transplantation of a preclinical basic science faculty from the University campus at Tuscaloosa to the metropolitan area of Birmingham. I have attempted to ascertain from members of our faculty who spent many years on the University of Alabama campus their reactions to the desirability of life on the campus as compared with the urban area. This can be summarized by stating that our basic science faculty appear to be far happier and more satisfied, in general, than they were on the University campus. There are a number of reasons for this, but basically it is still true among medical faculty, as with other population groups, that everybody loves to move to a large city.

It is unnecessary in this paper for me to attempt to enumerate the various advantages that accrue to people who live in a metropolitan area, as contrasted to a smaller city, but the faculty member, his wife, his children, and family are all susceptible to the same influences in their general living that makes city life desirable. It is the same set of factors, no doubt, that makes physicians migrate to the larger cities, rather than remaining in rural areas and small towns. In particular, I have noted that the faculty wives who previously resided on the campus at Tuscaloosa have found new outlets for their numerous abilities in a larger metropolitan area. Many of them participate very actively in civic and community affairs, these opportunities apparently being denied them to a large extent while living in a more restricted campus area. One of our preclinical professors summed up the situation very well when he told me he had been astonished to discover that since moving to Birmingham he is really considered to be a very important person. His life is no longer circumscribed by the University activities to which he had become accustomed by many years' residence on the campus. He discovered that his neighbors and friends, who comprise people in all walks of life, really look upon a medical school professor as a very important person, but, as he expressed it, down on the University campus he was just another professor. This general approbation of medical school professors as we have seen it in a large city tends, of course, to inspire confidence and produce a general state of satisfaction, if not actually inflating the ego of our professorial group.

The preclinical group are also considerably stimulated over the increased contacts from daily and constant association with our large group of voluntary faculty, who represent the best element of the practicing physicians in the City of Birmingham. It has served to emphasize the importance of close relationships between clinical and preclinical medicine and has done much toward developing an interest and enthusiasm in research problems of clinical medicine. The cordiality and enthusiasm with which the preclinical group of professors were welcomed by the clinical group, in general, has been a source of great satisfaction.

The fact that a medical school is located in a large city does not necessarily cut off its affiliations with scientific and educational groups—since there are many such groups in practically every large city. Only one block away from the Medical College of Alabama is the Southern Research Institute, with a staff of some seventy full time men in the fields of Physics, Chemistry, Biology, and other basic sciences, with considerable cooperative research between the two groups.

Another important consideration favoring a metropolitical location is the ever present opportunity of securing substantial monetary gifts for various phases of medical school activities. Our institution is relatively new in Birmingham and, furthermore, our city is not distinguished by large groups of wealthy people. Nevertheless, our institution has been the recipient of a considerable number of monetary gifts of substantial size and this would not have been possible had the institution been located on a distant campus. For example, our Department of Opthalmology operates at an annual budget of some $20,000 yearly, which would have been utterly impossible without the interest of local citizens in its activities. The fact that medical college faculty members have an opportunity to become intimately associated with people of wealth and means in a metropolitan area always enhances the chances that gifts of various types may be forthcoming to the school for its various activities. I believe that an outstanding example of that is the experience of Emory University in Atlanta, Georgia, where the people who are directly or indirectly associated with the Coca-Cola Company for a number of years have given the institution literally millions of dollars. Had the institution been located at Oxford, Georgia, as it was a hundred years ago, it is extremely doubtful if such outside interests would ever have developed.

A medical school located in the metropolitan area has the greatest opportunity to become a real instrument of public service, which, in my opinion, is what medical education needs to do now and in the years ahead. All of our educational institutions, whether they be tax-supported or privately endowed, are ultimately dependent upon the generosity and interest of the public at large. On the one hand, the operating expenses came from tax sources and, on the other hand, through the medium of gifts. Nevertheless, in either case, if the activities of the institution are publicized and if it is constantly demonstrated that it renders a real public service, the greater will be its support in the years ahead.

A medical college in the metropolitan area has splendid opportunities for demonstration of its value to the public welfare. Its activities are always a matter of interest to the public press and the public is usually aware of the work that goes on in the medical school and, in general, there is a much greater sense of public awareness than could possibly be developed in a more remote campus atmosphere. Since much of its activities include the care of large numbers of sick people and offering medical care to a substantial section of the community in which it is located, the public always

maintains a keen interest in the affairs of the school. The public soon learn that the medical college, as contrasted with other educational activities, is a great instrument of social and humanitarian service in its community.

There are many areas in a metropolitan area where a medical school may become a real forceful instrument of public service wholly apart from its educational activities per se. For example, our Mental Hygiene Division works very actively with the police courts and with the courts of juvenile delinquency. We collaborate in attempting to solve the problems of alcoholism and psychiatry as we see it in a large metropolitan area. Our Obstetrical Division is responsible for all of the obstetrics at the local Salvation Army Home for Unmarried Girls. Our Departments of Ophthalmology and Otolaryngology assume full responsibility for the examination and treatment of 1,500 children at the State Schools for the Deaf and the Blind. Our institution, being closely related to the Public Health Division of our city and county, has great opportunities to do field work in this important aspect of medicine. Our faculty staffs completely the state-wide Crippled Children's activities. We service a large Tumor Clinic, which is operated by the State of Alabama. In many important activities of medical public life the institution can leave its imprint upon the practical problems of medical care throughout the area. As a general rule, the medical college located on the campus situation does not have these multiple opportunities for community service.

Furthermore, in the future our medical colleges will be concerned with the great problem of the care of the veteran. A large Veterans Hospital will be found in association with nearly every medical school. This, of course, represents another area of public service and since it is the policy of the Veterans Administration to construct hospitals in close proximity to medical schools, this policy is being implemented more rapidly in the metropolitan areas than it is in the campus situations. The basic policy of the Veterans Administration, and properly so, is that a Veterans Hospital is better located near a metropolitan medical school than near a campus medical school because in the event of collapse of either of the schools the hospital then would always be located in an area where a large number of competent physicians are readily available.

The medical students have certain advantages in a metropolitan area, including access to medical and scientific programs sponsored by local medical and professional groups. Thus, when the headquarters of the local medical societies are located in the school, as it is in Birmingham, student attendance at such meetings is a frequent occurrence.

Other advantages to the medical students in the metropolitan area are the numerous opportunities for employment not only during the school year on a part-time basis, but also during the summer months. In recent years this has not been a problem of great importance because of the large number of students who are supported under the G. I. Bill of Rights, but the time will come, no doubt, when medical students will have financial difficulties and suitable employment may make the difference as to whether or not he fails to get through medical school. Such opportunities are readily available in a metropolitan area.

Some believe that the cost of living for faculty and students is less in a campus area than in the metropolitan area, but, in my opinion, this is not true. Certainly the cost of clothing, most articles of food, various appliances, automobiles, etc., is just the same and, in some instances, even cheaper in the larger city because of greater competition. However, this is an argument sometimes used to justify the differential in salaries that may be paid to medical faculties as contrasted to the salary ranges of other divisions on the campus.

In conclusion, I am quite convinced that the advantages of a metropolitan area location far outweigh the disadvantages of not being on the university campus, and this is particularly true if the institution is in position to own and operate its own teaching hospital. Furthermore, if the basic policy is one directed to make the school a real instrument of public service and to participate in every possible phase of community life, it has greater opportunities in the metropolitan area.

It seems to me that public support of medical schools will be considerably greater if the above policy is followed, rather than operating a medical school that becomes too isolated in its academic sphere of activity. Indeed, I have heard it said, with some truth, that the participation of medical education in the United States in the medical care of the veteran will, within itself, guarantee a degree of stability and support that otherwise would not be possible. Even at this time we see large groups of American citizens, such as the ex-service organizations, who are ready to stand behind our medical colleges because of the services they are rendering to the medical care of the veteran.

As in any other educational activity, the future of our medical schools will be dependent upon the public service that the institutions render to their areas, but, in addition to rendering this service, the public must be taught that medical education is indispensable to the public welfare. This can be done only by projecting the activities of the medical school into every area and facet of community life. Opportunities for this course of action are far greater in a metropolitan area than they would be on any university campus.

APPENDIX D

SURVEY BY PROFESSOR R. N. HARGER OF UNIVERSITY OF INDIANA OF OPINIONS OF MEDICAL SCHOOL FACULTY MEMBERS ON QUESTION OF SEPARATION OF MEDICAL SCHOOL FROM REST OF UNIVERSITY

Indianapolis, Indiana
April 19, 1948

To the Committee on Location of the First Year of the Indiana University School of Medicine:

INFORMATION OBTAINED FROM OTHER MEDICAL SCHOOLS LOCATED PARTLY, OR WHOLLY, IN A SEPARATE CITY FROM THE PARENT UNIVERSITY

Obtained by R. N. Harger, Chairman, Department of Biochemistry and Pharmacology.

At the first meeting of this Committee the writer was assigned the task of trying to obtain information and advice from faculty members of those medical schools which, on account of limited clinical facilities in the parent university town, have been located partly, or wholly, in a larger city.

At the present time there are in the United States 70 approved medical schools. As regards proximity to the parent university they are divided as follows:

I. No parent university 8
II. All of medical school on same campus with university 17

Of particular interest are the answers to questions 3 and 4, page 2, and question 4, page 3.

III. All of medical school on separate campus:
(a) In same city with university 16
(b) In another city..... 19
IV. Part of medical school on parent university campus:
(a) Remainder in same city 5
(b) Remainder in another city 5

Total 70

The individual medical schools in the various above subdivisions are listed in the appendix.

These medical schools which are, or have been, faced with our present problem are groups III (b) and IV (b), Indiana being in IV (b). Questionnaires were sent to 17 of the III (b) schools and to 4 of the IV (b) schools. Since it was probable that the clinical teachers generally favor an undivided medical school, the questionnaires were sent to deans and to faculty members in the pre-clinical fields. The names of the pre-clinical faculty members contacted were selected more or less at random, most of them being first-year teachers. A total of 58 letters were sent and to date replies have been received from 52 of these questionnaires. Many of these replies were rather long and included useful information not specifically requested in the questions.

The questions sent to the faculty members and the categorical replies received are listed in Tables I and II, below:

Table I

Group III (b) schools. (17)

(Located on separate campus in another city.)

Answers received from 2 vice-presidents, 14 deans, 7 anatomists, 13 physiologists and 4 biochemists.

1. From the standpoint of student instruction, do you like your present arrangement, or would you prefer to have your first year given on the parent university campus? *Answers:* Present arrangement preferred, 40; prefer parent campus, none.

2. Does the presence of first-year teachers on your campus result in better post-graduate instruction and improved research? *Answers:* Yes, 40; No, none.

3. Has the isolation from your university of all four years of medical teaching resulted in fewer graduate students in the pre-clinical sciences of your medical school? *Answers:* Yes, 13; No, 19; Undecided, 8.

4. Since courses in physiology, anatomy and biochemistry are probably still being given on your parent campus, does not this duplication of courses represent a financial waste? *Answers:* Yes, 1; No, 39.

5. Did you at one time give the first year or two of your medical school work on the parent campus? *Answers (by schools):* Yes, 6; No, 11.

Table II

Group IV (b) schools. (4)

(Part on parent campus, remainder in separate city.)

Answers received from 5 deans, 2 biochemists, 2 physiologists, 1 anatomist and 2 pharmacologists.

1. From the standpoint of student instruction, do you like your present arrangement, or would you prefer to have all of your medical school instruction given at your medical center? *Answers:* Prefer present arrangement, 4; prefer medical center, 5; undecided, 3.

2. Would the presence of the first year teachers at your medical center result in better post-graduate instruction and improved research? *Answers:* Yes, 9; No, 3.

3. Would the isolation from your university of all four years of medical teaching result in fewer graduate students in the pre-clinical sciences? *Answers:* Yes, 5; No, 5; Undecided, 2.

4. If your medical school were all moved to the medical center it is probable that courses in physiology, anatomy and biochemistry would still have to be given on the parent university campus. Would this duplication of courses represent a financial waste? *Answers:* Yes, 2; No, 9; Undecided, 1.

5. Do you have plans for moving all of your medical school to your medical center? If so, when will this move be made? *Answers:* California, Yes. Will take two or three years. Stanford, Yes. When money is raised, probably two or more years. Kansas, Yes. When the necessary $1 million is in sight, which it is not now. Medical Evangelists, No. This would mean abandoning the Loma Linda campus.

Other Information in the Replies

This portion of the material cannot be easily presented in tabular form. If possible, each committee member could profitably read the individual replies. I would particularly urge you to read all replies from representatives of the four divided schools in class IV (b). They are California, Kansas, Medical Evangelists and Stanford. The remarks of Dr. Andrew C. Ivy, Vice-President of Illinois, and Dr. Anton J. Carlson, Professor Emeritus of Physiology, University of Chicago, are especially worthy of consideration and have been included in the appendix.

Summary and Remarks

1. Representatives of the 19 medical schools having the arrangement which is contemplated for Indiana (III (b)) were unanimous in preferring this set-up to our present organization.

2. Six of these 19 Class III (b) medical schools were once divided schools, but later abandoned this arrangement.

3. Of the 62 medical schools having a parent university, 35, or 56.6 per cent, have all four years on a campus entirely separate from that of the parent university. Even those in the same city are almost as much isolated from the parent university as those in a separate city.

4. Two divided medical schools in our group (IV (b)) have decided to move all four years to the medical center campus. A third, Kansas, is seriously considering this move. Medical Evangelists has no liberal arts college, and is hardly comparable to us as regards this problem.

REPORT ON UNIVERSITY OF MISSOURI SCHOOL OF MEDICINE BY THE SPECIAL COMMITTEE OF THE CURATORS, NOVEMBER 8, 1950.

To The Curators of the University of Missouri:

I. Recommendation

Your Special Committee established in May 1949 to study and make recommendations concerning the School of Medicine at the University of Missouri recommends as follows:

That the action taken by the Curators in 1945 ordering the restoration of the last two years of the curriculum in Medicine at the seat of the State University at Columbia be and hereby is reaffirmed and that steps be taken immediately to implement this decision.

This reaffirmation of a decision made by the Curators

in 1945 is intended, so far as the Committee is concerned, to commit the Curators to a permanent and final decision on two matters; i.e., (1) that the University of Missouri should establish a four-year School of Medicine, and (2) that the School be located on the main campus of the University at Columbia. The Curators have had these matters under almost constant study since 1909. Many exhaustive surveys have been conducted and all reasonable suggestions have been carefully and patiently considered. Further contention on either of these matters will serve only to postpone the establishment of this service which, we believe, the people of Missouri need and want. Therefore, your Committee hopes that the present report, if accepted by the Curators, will be deemed a final and irrevocable decision on the matters dealt with.

II. Résumé of Steps Leading to Present Recommendations

Since the suspension of the last two years of the medical curriculum by the Curators in 1909, the restoration of this curriculum has been given constant study and attention. The appropriation for Noyes Hospital was sought in 1920-21 for the purpose of restoring the clinical years in the school. This hospital was to have been the first unit in a University teaching hospital but other units were never provided for. In 1930 partly as a result of the recommendation of the State Survey Commission appointed by Governor Caulfield, the Curators announced the restoration of the clinical years.

As the President of the Curators, Allen McReynolds, said in his address to the Jackson County Medical Association on June 28, 1949:

"Undoubtedly, this action was stimulated by the report made by the State Survey Commission, appointed by Governor Caulfield. This Commission was charged with the responsibility of examining the situation of the institutions of the State, educational, penal and eleemosynary and the tax system. The Chairman of the Commission selected by the Governor, was Theodore Gary, who had previously rendered such excellent service as Chairman of the Highway Commission. The technical advisers in the research were Doctors Strayer and Englehart, members of the Division of Field Studies of Columbia University, New York. The members of the Commission, with the assistance of these gentlemen, and their associates, made a careful study of the institutions of the State, including the University of Missouri. In the course of that study the technical staff, among its other recommendations, made the following as to the School of Medicine at the University of Missouri:

"The service of the School of Medicine to the State is at present very greatly limited by virtue of its situation as a two-year institution. There are amply comprehensive data to show that the State of Missouri should provide a four-year medical curriculum at the University. Such a curriculum would necessitate increased expenditure for staff, buildings, equipment and maintenance. It is the judgment of the survey staff that the State should give serious consideration to the advisability of expanding its Medical School with a view to providing an adequate program of medical education.

"*In order to carry out the development of the Medical School on a four-year basis, it will be necessary to build and maintain a hospital for clinical purposes. The increased facility of transportation in Missouri now thoroughly justifies the building of a state hospital at Columbia, which is centrally located. Such a hospital is not limited to the satisfaction of the needs of the Medical School alone but would fulfill two distinct functions: (1) The first step in the solution of what is now generally recognized as a serious problem of inadequate hospitalization facilities for the large rural population of the State, and (2) the provision of clinical facilities for teaching and research in the field of medicine. Provision has been made in the statements elsewhere in this report of the building program of the University for such a hospital.*" (italics ours)

But the Curators were unable to carry out this policy due to lack of funds during the depression years.

Constantly seeking to provide means for restoring the complete curriculum, the Curators' efforts were temporarily blocked in 1937 when the State Medical Association in a report on the subject, said:

"The figures of Missouri's medical necessity show that Missouri is overpopulated with doctors in her larger centers, that the State has about the same distribution of doctors in the smaller centers as any other State in the Union, and that the conclusion would therefore be drawn that Missouri does not need another Medical School."

In 1945, after renewed study of the subject, the Curators published their "Survey of Medical Education" based upon a study of the situation in Missouri and several other states. In July of the same year, the Curators ordered:

"That the four-year course in the University of Missouri School of Medicine, reduced to two years in 1909, later enlarged to four years and again reduced to two years in 1932, be resumed again at the seat of the State University at Columbia as soon as necessary funds are provided for the complete program."

Since that time every session of the General Assembly has been requested to appropriate funds for this purpose.

The Board of Curators Report on the University of Missouri Survey of Medical Education published in 1945 was studied carefully by interested groups which were making similar surveys in North Carolina and Florida. These groups reached the same conclusion for their states that the Curators reached for Missouri, i.e., that Medical Schools should be established on the University campus and not in a large city. In all three cases, the group making the survey had in mind not only the training of more physicians but also the availability of medical care to the people of the state. This is indicated by the following excerpt from the "Missouri Survey" report (p. 15):

"Of special importance to this study is the effect of a particular plan of organization on the problem of providing a more adequate supply of medical practitioners for the rural areas of Missouri. Providing educational opportunities for the youth of the state is not the sole function of a state university. *There is also the obligation on the part of the professional schools of the university of supplying professionally trained men and women who will make their services available to the citizens and communities within the state.* The acute shortage of doctors in the rural areas of Missouri makes it incumbent upon the State University, if its Medical School is to be expanded, to develop a program of medical training that will recognize the rural medical problem." (italics in original)

In May 1949, the State Medical Association published another study of medical education in Missouri in which the Association advocated the establishment of the four-year School of Medicine in Kansas City. At the same time, the Curators began a further intensified study of the subject at the earnest solicitation of one of our esteemed members, Dr. Hendren, and constituted the

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in acute laryngotracheal bronchitis

CASE	DIAGNOSIS	INFECTING ORGANISM	DAYS TREATED	TOTAL DOSE GM.	ADMINISTRATION	CONDITION AND RESULT
16	Acute laryngo-tracheal bronchitis	Hemophilus influenzae	3	12	oral	Marked improve-ment in 24 haurs. Recovery

Case report taken from Herrell, W. E.; Heilman, F. R., and Wellman, W. E.: Ann. New York Acad. Sc. 53:448 (Sept. 15) 1950.

CRYSTALLINE

Terra

prompt response

in acute follicular tonsillitis

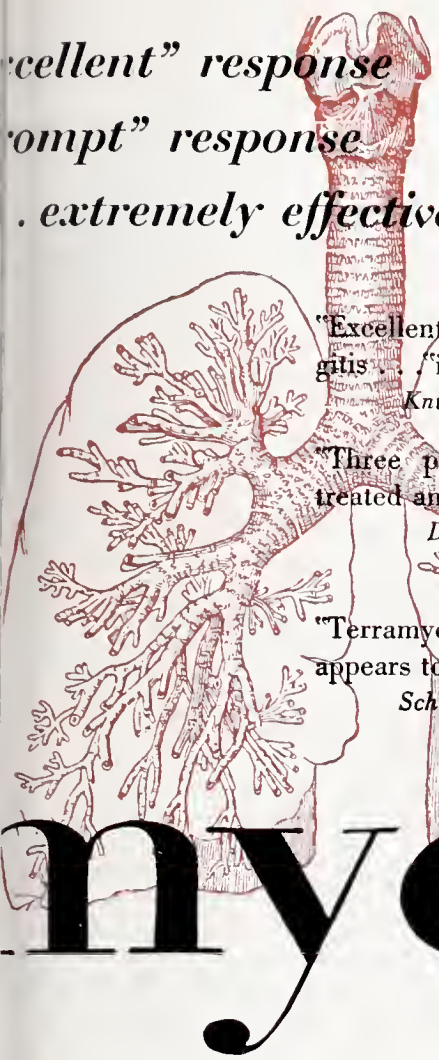
CASE	DIAGNOSIS	CULTURE		DAILY DOSE GM.	NUMBER OF DAYS TREATED	RESULT
		SOURCE	ORGANISM			
29	Acute follicular tansillitis	throat	Strepto-coccus pyogenes	4	3	Prompt clinical response. No fever after 24 hours of treatment

Case report taken from Herrell, W. E.; Heilman, F. R.; Wellman, W. E., and Bartholomew, L. A.: Proc. Staff Meet., Mayo Clin. 25:183 (Apr. 12) 1950.

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ompt" response
. extremely effective"

in acute pharyngitis



"Excellent" results in 3 treated cases of streptococcic pharyngitis . . . "improved promptly following terramycin therapy."
Knight, V.: New York State J. Med. 50:2173 (Sept. 15) 1950.

"Three patients with beta-streptococcic pharyngitis were treated and made a prompt recovery."
Dowling, H. F.; Lepper, M. H.; Caldwell, E. R., and Spies, H.: Ann. New York Acad. Sc. 53:433 (Sept.) 1950.

"Terramycin (250 mg. every three hours) when given orally appears to be extremely effective."
Schenck, H. P.: M. Clin. North America 34:1621 (Nov.) 1950.

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present special committee composed of Roscoe Anderson, John H. Wolpers and Glenn W. Hendren. The Committee employed a special investigator to assist in its study, Harold S. Diehl, M.D., Dean of the Medical Sciences, University of Minnesota. In June 1950, the Committee received a formal report from Dr. Diehl and immediately made this report available to all members of the Board of Curators. Facts and considerations embodied in his study form, in part, the basis of this report by the Committee to the Curators. The task assigned to Dr. Diehl by the Committee is succinctly summarized by Dr. Diehl himself in his report (p. 203):

"The report which I am submitting is based on my analysis of available information, my evaluation of opinions expressed and my appraisal of the situations presented. I will not attempt to make decisions for the University of Missouri, for this is obviously the responsibility of the Board of Curators. My report, however, does express definite opinions concerning the desirability of the University of Missouri establishing a medical school, the instructional programs which should be offered and the costs involved. On the question of location I will attempt to summarize objectively and fairly the conditions which are essential for the establishment of a first-class medical school in either location and to analyze the factors in each location which would be assets in meeting these conditions."

III. Missouri's Needs and Resources for a Complete Medical School

Dr. Diehl, in his report, outlines the advantages and disadvantages of the respective locations in a manner similar to that found in the "Missouri Survey" of 1945. He did not discover and develop any major factors which had not been considered in 1945. It is his opinion that a strong school can be maintained in Columbia. He states emphatically that:

" . . . the medical schools of this country offer conclusive evidence that it is possible to have good medical schools in either situation. For Missouri this means that if essential requirements can be met it should be possible to develop a strong medical school either in Columbia or in Kansas City. (p. 213)"

That the State of Missouri needs a medical school as a part of the State University, Dr. Diehl stresses when he says (p. 212):

"Another value of a state university medical school is that it sets standards of medical practice within the state and assists physicians to practice medicine in accordance with these standards. Private medical schools are an asset but they rarely fill the same roles or render the same services as do state-supported schools. Furthermore, a good medical school is a scientific, cultural and economic asset to a state. From the point of view of need, therefore, it would seem that Missouri should provide and support a first-class medical school. And certainly, the State of Missouri is as well able as most states in the Midwest to do so."*

Again (p. 204) he says:

"For many years most states in the Midwest have supported Medical Schools in connection with their state universities. In fact, Missouri is the only state in this area with population and resources adequate for the support of a state university medical school that does not have one."

Dr. Diehl goes on further to indicate why the states support medical schools in connection with their universities (p. 204):

"The primary reasons that states support medical schools are to train physicians who will provide medical care for the people of the state and to provide opportunities for young men and women of the state to be educated in medicine and the allied professions. These purposes are accomplished by providing undergraduate medical education, by the training of specialists and by postgraduate medical instruction for physicians in practice so that they may keep abreast of the progress which is constantly being made in the science and the practice of medicine. Closely related to these primary purposes of a medical school are other functions of almost equal importance. Prominent among these are: the conduct of medical research which will extend our knowledge of the prevention and cure of disease; the provision of medical care for thousands of citizens of the state who each year are served in the teaching hospitals and their outpatient departments; and the training of allied professional groups such as nurses, medical technicians, dietitians, physical therapists and occupational therapists.

"In these days of world chaos and uncertainty it is impossible to predict the future of institutions—political, social, economic or educational. Yet this much is certain, that come what may, medical education and medical research must continue. Whether this country remains at peace or engages in war, whether we continue as a democracy or resort to some other form of government, whether we hold to the economic principles of capitalism and individual initiative or go farther in the direction of socialism, the health of the individual and of the public must be safeguarded or the situation becomes hopeless. War increases the need for medical and public health services, both for the armed forces and for the civilian population. A breakdown or deterioration of these health services means demoralization. So, whether we are preparing for peace or for war, our country needs to expand and strengthen medical education, medical research, and medical and public health services."

Thus, Dr. Diehl's words confirm the findings of the Curators stated in the Report of 1945. Furthermore, the facts show that Missouri boys and girls have only one-half the chance of being admitted to medical school at present, as a comparable youth from Tennessee, Colorado or Nebraska. As Dr. Diehl puts it (p. 204):

"In other words, Missouri is not offering to its citizens nearly as good opportunities for the study of medicine as those offered by other states in the same general area."

Another important factor here is indicated by Dr. Diehl (p. 206):

"In the Medical School the basic program should be directed toward the training of physicians for the general practice of medicine. This must be kept clearly in view as the primary function of the Medical School. Supplementary to this, however, programs of graduate training in the various specialties of medicine should be established and continuation study courses for the practicing physicians of the State should be organized."

This means, we believe, that a continuing program from the State University Medical School would help to

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*EFFECTIVE BUYING INCOME OF A GROUP OF MIDWEST STATES FOR 1949 AS GIVEN BY DR. DIEHL FROM SALES MANAGEMENT, MAY 1950.

Illinois	$8,219,271,000
Michigan	6,503,797,000
Missouri	3,763,446,000
Wisconsin	3,440,207,000
Indiana	3,227,880,000
Minnesota	2,901,975,000
Iowa	2,760,073 000
Kansas	1,963,524,000
Colorado	1,418,225,000

encourage physicians to settle in and remain in the rural areas.

IV. Reasons for Location of the School on the University Campus at Columbia

The Curators set forth at length in 1945, various reasons for their decision to retain the medical school on the University campus. We wish to emphasize these and other considerations which influence our decision:

1. Only from a school on the campus could the medical program of teaching and research be made to serve adequately a program of medical and health extension for people of the state in case such a program were provided.

2. The training of doctors on the campus would be more conducive to their settlement in rural areas where they are needed most. In this connection Dr. Diehl points out (pp. 204-205), that in recent years, few physicians have been establishing practices in rural areas than the number lost in these areas by death and retirement. He points out that a study made in Minnesota shows that 60 per cent of the graduates of the medical school who grew up in rural areas returned to practice in these areas while only 29 per cent of students from cities went to rural areas. As he further indicates (p. 205):

"In other words, the chances are more than twice as great that a medical student who has grown up in a rural community will practice medicine in a rural area than that a medical student who has spent his life in a large city will establish practice in the country. A conclusion that can be drawn from this is that one effective way to increase the number of physicians in rural communities is to increase the number of medical students from rural areas. A state university medical school could do this in Missouri by increasing the opportunities for young men and young women from rural communities to study medicine."

A small town setting on a University campus offers an opportunity for developing an atmosphere more conducive to encouraging students to return to small communities than would be possible in the environment of a large city.

3. The central location of the University makes it a logical and convenient place for a medical center for Missouri. Such a medical center should serve, as Dr. Diehl points out (p. 208), to make it possible for physicians to refer patients who present special problems of diagnosis or treatment to the University medical school. The School, by its reports on these patients would conduct an effective system of postgraduate or continuing medical education for physicians. Citizens of the state also, upon request by their physicians, would have the benefit of consultation with members of the Medical School Faculty. *But all this interchange of patients and services is possible only if the medical center is easily accessible to all parts of the state. Certainly, more than half the state would not have ready access to these services if the University medical school were placed on the western border of the state.*

4. Existing facilities, the University General Hospital, the Cancer Hospital, the Crippled Children's Service, the physical plant of the present School of Medicine and the central power, light, maintenance, and service facilities give the University a large investment in facilities for medical education at the present time, and other state facilities in Central Missouri are easily accessible to the campus.

5. Also, as is noted by Dr. Diehl (p. 211), "administrative practices and procedures are simplified and facilitated if a medical school is on the same campus as the rest of the University." As experience has proved in several states, it is difficult if not well-nigh impossible to retain effective central administrative control over a medical school located off the campus in a large city.

6. The campus location gives faculty and students of the School close contact with fundamental and related sciences available on a University campus. But, as Dr. Diehl points out, (p. 212), there are other real advantages in this connection also for the University itself:

"Among these are the leadership which the medical school gives in the biological sciences and the prestige that accrues to a university which has a distinguished medical school. Johns Hopkins University is known primarily for its medical school and the prestige of Harvard, Columbia, Washington University and others is enhanced by their distinguished medical schools."

7. Dr. Diehl is aware, also, of the difficulty in keeping the medical school free from non-educational control when it is separated from the University campus (p. 213):

"A medical school which is separated from the main body of the University must make a very special effort to keep strong and effective ties with its university. This requires even stronger leadership in the medical school than would be necessary if the school were on the university campus.

"It requires more effort also to keep it clear in the minds of everyone that the medical school belongs to the university and not to professional or other interested groups in the city in which it is located."

8. The campus location is best suited to develop the educational interrelationships of the medical division which are needed for the development of work in laboratory technology, dietetics, medical record, library service, social welfare, physical and occupational therapy and hospital administration.

9. Moreover the university itself gives the proper atmosphere in which a strong medical school ought to work and operate. This is well expressed by Dr. Diehl (p. 211):

"2. An atmosphere of scholarship and of scientific inquiry permeating the medical school. *It is exceedingly important, therefore, that the medical school be and function, not only in name but also in fact, as an integral part of the university.* This relationship is just as important, although somewhat more difficult to maintain, if the medical school is located away from the main university campus." (italics ours)

10. For medical research, interrelationships with veterinary medicine, agriculture, sanitary engineering, zoology, and genetics, are of the utmost importance. Dr. Diehl again states the case very well when he says (p. 211):

"A close association of the medical school with the rest of the university makes possible cooperative research enterprises and facilitates conferences and consultations on individual research problems. The departments of chemistry, physics, biochemistry, zoology, psychology, sociology, and veterinary medicine are concerned with scientific problems and employ scientific technics that are pertinent to the field of medicine."

V. The Case for Location in Kansas City

The case of the State Medical Association for location of the School in Kansas City rested largely upon two main contentions:

1. The greater amount of varied clinical material available in a city.

2. Lower cost of capital outlay and operation in a

city that is willing to offer hospital facilities for use of the School.

VI. The Case Against the Contentions for Location in Kansas City

The Committee has investigated carefully both of these contentions and they are dealt with at length in the report of Dr. Diehl. We believe the case for location of the School on the campus is greatly strengthened by the following facts which have appeared as the result of our study:

1. Clinical material is available, of course, in greater abundance in a large city hospital than it is in Columbia at the present time. However, it is generally agreed that 750 beds would give adequate material for training classes of 75 each in a school on the campus. As Dr. Diehl indicated (p. 204), since Missouri has two medical schools who train an average of 55 students a year from the state while 26 go to schools outside the state, the state university medical school need not provide facilities for more than 100 per class. We recommend, for the present, 75 per class as an adequate, conservative estimate. The Missouri Hospital Plan prepared by the Department of Public Health and Welfare, Division of Health of the State of Missouri and presented for approval to the Hospital Advisory Council in February 1948 was drawn up pursuant to requirements of Public Law 725 (the Hill-Burton Act) which provided for federal matching grants for construction of hospitals. The State Plan in Missouri designates Columbia as a base area with a matching fund allocation of 650 beds. In other words, the State Plan calls for building this hospital area into a base area with enough beds (plus those we now have) to provide adequate clinical material for a complete medical school. There seems to be no doubt that Missouri needs such facilities. The Diehl Report (p. 211) states this very emphatically:

"A large university hospital, such as is required for a medical school in a small community, provides a great deal of medical service for the people, particularly the poor people, of the state. According to the State Hospital Survey considerable expansion of such service is needed in Missouri. In fact, in many areas there are no hospitals to which physicians can refer patients who have difficult medical problems and are without financial resources to pay for private medical care."

2. On the matter of costs, much misleading information has been circulated. We agree with Dr. Diehl, who in his report (p. 214) says:

"It is vitally important also that the choice be made in terms of what is best for the medical school and the state over a period of fifty or one hundred years, and not what is currently the cheapest or most expedient. Likewise, it would be a major calamity to have the decision be made on any basis other than an objective appraisal of the situation without regard to past controversies or to pressures or political influence that may seem to be operative at the present time. The current generation of university officials and of the various other groups interested in the location of the school will soon be gone, while the medical school once established will doubtless continue as long as the university exists." (italics ours)

a. Capital Outlay-Hospital. It has been contended that the offer of Kansas City to turn over to the School control of its General Hospital would make it unnecessary for the State to build a hospital in Kansas City. *The report of Dr. Diehl shows conclusively that this contention is false.* He recommends, and the Committee is in unanimous agreement that even with control of the General Hospital and use of the Tuberculosis Hospital, Mercy Children's Hospital, and the Veterans Administration Hospital, the state would need to construct a hospital of its own, initially of at least 250 beds in Kansas City. In fact, we find that Dr. Diehl's own medical school at the University of Minnesota, which now has a hospital of 450 beds, is constructing an additional unit of 250 beds, even though this school functions in a metropolitan center greater in population than Kansas City. The University of Washington in Seattle is seeking to build a 450-bed hospital, the University of California has received funds to build a 250-bed hospital at its school in Los Angeles, and has requested funds to increase to 500 beds the hospital at its school in San Francisco. The University of Arkansas Medical School in Little Rock has received part of the funds to construct a 600-bed hospital in that city even though it has had the use of several hundred beds in other hospitals. And so we find it elsewhere; e.g., the University of Illinois Medical School in Chicago, Nebraska in Lincoln, Kansas in Kansas City, and Tennessee in Memphis. Dr. Diehl makes it clear that reasons for this practice are considered compelling by medical educators.

One of the more important of these is, as he states it (p. 212), that, "A University which owns all, or essentially all, of the hospital facilities which it needs for teaching never need be concerned with possible divergent or conflicting interests on the part of the staff, management, or trustees of teaching hospitals which are not completely under university control."

Moreover, it is clear that medical schools in large cities which have small teaching hospitals are anxious to increase the size of these hospitals up to the size needed for a school on the University campus.

Dr. Diehl, in this connection (p. 210), cautions against regarding the large cost of the hospital as necessary only for educating physicians, since "they include also the costs of providing the best of medical care for tens of thousands of the citizens of the state." (italics ours) Of course, the 250-bed hospital in Kansas City recommended by Dr. Diehl would not take care of "tens of thousands" of citizens and would not be available to people from most parts of the state. As he indicates elsewhere (p. 213) the estimate of 250 beds for the Kansas City location is too low and he specifically recommends that the amount of ground in that location should be sufficient, "for possible future expansion both of the medical school and of the hospital."

The real answer to the matter of costs so far as location is concerned is given by Dr. Diehl (p. 210), when he says:

"Furthermore, since the state survey indicates that additional hospital facilities are needed in Missouri, the costs for the construction and operation of a university hospital are costs which the taxpayers of the State will have to meet whether or not a university hospital is constructed. That is, if the needed beds are not provided in a university hospital, they will doubtless be provided in small hospital units scattered throughout the State."

b. Capital Outlay—Medical School. Plant facilities for a medical school do not now exist at all in Kansas City nor are there any facilities for dormitories, library, or laboratories, nor any central plant for power, heat, and maintenance. All these exist at the University—dormitories and even a medical school building and laboratories which would only require enlargement.

c. Operation. We find no evidence that costs of operation would be substantially different wherever the

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School was located except that instruction in auxiliary subjects is available at the University and would probably never be made available off the campus except at prohibitive expense. Moreover, the University campus would still have to maintain departments for instruction in such subjects as bacteriology, physiology, biochemistry, and anatomy for students in other schools. Dr. Diehl notes this in his report (p. 211) and indicates elsewhere (p. 207) that the greater cost of teaching basic medical sciences on a university campus is due to the services they render to students in other divisions. He warns that these costs should not be charged to medical education yet nowhere in his computation of comparative costs, does he make allowance for this. He does make some allowance for the increased cost of the bursar, registrar, purchasing and accounting, and maintenance services when the medical school is located off the campus.

It is impossible to compute in figures, the value of "close association of the medical school with the rest of the university which makes possible cooperative research enterprises and facilitates conferences and consultations on individual research problems. The departments of chemistry, physics, biochemistry, zoology, psychology, sociology and veterinary medicine are concerned with scientific problems and employ scientific technics that are pertinent to the field of Medicine." (Diehl p. 211) *It should be noted that all these values would be lost if the medical school were located off the campus.*

All these considerations bear upon the question as to whether the matter of location can be decided largely on the basis of cost of cooperation. There are other intangibles, also which are difficult to measure. Dr. Diehl (p. 211) refers to some of these when he says:

"The major advantage of Columbia as a site for the development of a medical school is that the University of Missouri is located there. The spirit of scholarship and and scientific progress which is found on the campuses of great universities is distinctly helpful in the development of a strong medical school. In fact, a medical school which is separated from the university must cultivate such an atmosphere within its own walls."

3. The Committee desires to point out that a Medical School hospital on the University campus would be available for use by citizens of the whole state if some system of medical and health care were developed under the auspices of the proper state agencies. The University's proper function is to control and operate a teaching hospital where medical care, incidentally, is available to all who are admitted. We wish to point out that if the University controlled and operated the General Hospital in Kansas City, the priority for all space in that hospital would still have to be, as at present, for residents of Kansas City.

4. The Committee wishes to point out, in this connection, that there are two problems which the Curators have thoroughly explored in the past and which pertain to the general policy for administration of the School of Medicine, problems properly reserved for determination by the Curators in their capacity as the governing board of the University. The Committee wishes to refer to them briefly here.

a. The bringing of patients to the teaching hospital.

The Committee firmly believes that it is a proper function of the Curators to operate a teaching hospital. Medical care, from the point of view of the University, is a necessary by-product of operating a teaching hospital for the purpose of training medical students. When the patient is delivered to the teaching hospital, the University should then become responsible for him since it operates the hospital in which the patient is entered.

Protection of the educational program, however, requires that definite limits be set to the University responsibility for furnishing medical services. A state policy in this field involves agencies other than the University and its Medical School. Within the limits of good medical education and research, the University Hospital can relieve part of the load from state agencies whose primary responsibility it is to give medical service but this task is far too large for the medical school to assume the full load. Sound planning for the operational policies of the University Hospital requires immediate coordination of long range planning being done by the various state agencies that are now concerned with offering medical services. The Committee recommends that the Curators indicate at once their willingness to enter into such planning with other state agencies.

The Committee wishes to stress the fact that this problem of bringing patients to the hospital is the same whether the state hospital is located on the campus or elsewhere, since clearly, the state would not wish to furnish hospital facilities for residents of one locality only, nor could the state afford, in our opinion, to limit access to state hospital facilities to the patients of certain physicians.

Various solutions of this problem have been tried. A large state hospital in the center of the state, with our system of highways, would attract many patients from all over rural Missouri. In addition, as in Iowa, Wisconsin, Michigan, and Virginia, state and local units of government could furnish the means of transporting patients from local centers to the teaching hospital when its services were deemed necessary. Clearly, the University campus has the advantage of central location for this purpose.

b. Teaching staff for the Medical School. Medical schools, in the past few years, have encountered many problems in establishing policies for the appointment of members to the teaching staff. These problems are not different in character whether the school is located in a small or a large city. Various methods of staff appointments are in use and all have been given careful study. Many students of the problem agree with Dr. Diehl (p. 213) that some combination of full-time and part-time teachers may be necessary since part-time teachers "cannot devote the time to teaching that is required of those who carry the major responsibility for the modern clerkship type of instruction." It is quite clear that the problem of securing adequate teaching staff can be solved for a medical school on the campus. As to what form of appointment is to be preferred, this is a matter of administrative policy, of course, which the Curators must decide when the complete school is reestablished.

In any event, as Dr. Diehl admonishes (p. 214) we insist that (italics Dr. Diehl's):

"4. For the development of a strong medical school, it is essential that the school be recognized and function as an integral part of the university. Special interests, sectionalism or politics must not be permitted to influence its development, its policies or its operation. The interest, understanding and support of private citizens and of lay and professional groups is desirable and necessary, but the university *must direct and control its medical school.*"

This warning indicates one of the major reasons why the school must be located on the University campus.

5. Finally your committee wishes to repeat here some of the wise words of counsel embodied in the "Missouri Survey" made by the Curators in 1945. These statements were made by leading educators and thinkers on medical schools and their problems and by administrators who have tested and tried the principles of operation of these schools in universities located in small cities. *We believe their warnings and opinions are as sound now as when they were written and we recommend that careful consideration be given to their words.*

a. The 1940 Medical Education Survey (p. 32—italics ours):

"The geographic separation of the medical school from the rest of the University may doubtless be explained by the influence of one or both of two factors Many of the schools of medicine began independently and only later sought the educational support of universities, or the medical schools have been located where clinical facilities, hospitals and outpatient departments were readily accessible and generally serviceable.

"These separations admittedly deprived the medical school of certain educational advantages. *Among the medical schools receiving the fifteen highest rankings* for organization, eight were centralized, six were partially decentralized and one completely decentralized. *Only one of these schools was located in a town at a considerable distance from its parent institution. Among the fifteen schools ranked lowest* for medical school organization, six were completely decentralized and two partially decentralized; *only one was located on a university campus.*"

b. The Missouri Survey of Medical Education 1945 (pp. 24-26):

"Dr. Alan Gregg, Director of the Medical Sciences for the Rockefeller Foundation, when asked by the President of the University of Missouri to express his views on the best plan of organization for the most effective program of medical training, stated that he was opposed to the separation of the medical school from the rest of the University. Dr. Gregg emphasized the point that 'the physics and chemistry of today become the physiology and pathology of tomorrow and the clinical medicine of the day following. It is therefore unwise,' he continues, 'to separate the medical school from the rest of the University, and the more so since such a separation increases the prestige of practitioners rather than the teachers of medicine in the faculty, and it is not in the atmosphere of a trade school that the best medical practitioners are made.'

"In a later memorandum submitted to the President of the University of Missouri and with the Missouri situation particulary in mind, Dr. Gregg set forth his views in full. His statement follows:

" 'Missouri for a long time will need doctors accustomed to and contented with life in the smaller towns. Large cities set before medical students the attractions of city practices, of early specializing, of migration to the still larger cities and of something nearer to commercialism than can survive the test of rural practice.

" 'All administration by the University officers is weakened and retarded by separating the Medical Faculty from the rest of the University; and even greater loss would result from separating the medical school (faculty and students) from the easiest possible contact with the physicists, chemists, biologists, psychologists, anthropologists, sociologists, and the humanists of the University.

" 'I know of no university medical school in a large city which within my memory has not had at least one serious quarrel between the university and the powerful and privileged professional leaders in the city; unless your university medical leaders are resigned to offering teaching positions in return for support and collaboration of clinicians with few other claims to attention, they may well prepare themselves for a decade of pressures and political maneuvers. Usually if appointments are made quid pro quo and at a distance from the university, the character of the school depends on forces only slightly under the university control.' " (italics ours)

c. J. L. Newcomb, former President of the University of Virginia:

"First I would unquestionably state that the experience of the University of Virginia has thoroughly justified the wisdom of its firmly held judgment that a four-year medical institution should be located as an integral part of a state university, and not maintained as a separate unit away from the University. This decision was reached in Virginia in 1922, and our experience since that time has amply justified the wisdom of keeping the medical school at Charlottesville. (italics ours)

d. E. M. McEwen, M.D., formerly Dean of the College of Medicine, The State University of Iowa:

"I think that any medical school that is not on the same campus with the rest of the University is severely handicapped in the various fields of science. The cooperation of chemistry with biochemistry, physiology, medicine, etc., is of great value to the school. The opportunity of securing graduate students in biology and other fields to assist in research projects in the medical school is also of great value to both sides. . . . The size of your town is no handicap."

e. W. J. Meek, now Associate Dean, University of Wisconsin Medical School:

"When the Medical School was founded Madison was a town of only about 40,000 population. It was argued by many that clinics could not find enough material in such a small town. To meet that criticism in part there was developed our 'preceptorial system.' The fourth year of medicine was made a 12-month year consisting of 4 quarters. Two quarters of this year were spent by the seniors in various clinics, the students being under a specified member of the clinic, rather than the clinic staff. In this way Obstetrics was taken care of in the Maternity Center in Chicago. The plan has given the students an opportunity to see a great deal of extra clinical material under excellent practical guidance. It has also greatly helped in improving the practice of medicine in the state, for our preceptors have made themselves very worthy of the trust placed in them.

"The amount of clinical material coming to the State Hospital on the campus has constantly increased with the years. The automobile has practically doubled the Madison population. While clinical material is no longer a major problem, the preceptorial system is so satisfactory that it is being maintained." (italics ours)

f. Dr. Abraham Flexner, formerly of the Carnegie Foundation:

"Can the medical school be developed in a small town? I have visited every medical school in the United States and medical schools in every country in Europe. My answer to that question is an unequivocal "Yes," and I go further. The right kind of medical school cannot be developed away from the University." (italics ours)

g. J. L. Newcomb, former President of the University of Virginia (quoted above):

"The experience of the University of Virginia located at Charlottesville in a city of approximately 20,000 people, has demonstrated beyond the shadow of a doubt that a modern medical school can have all of the clinical material needed for the most adequate instruction in clinical medicine, in spite of the fact that it is located in a small community. . . . You need have no fear that a first-rate modern medical school can have all the clinical material which it needs if it is located in a small town." (italics ours)

h. A. C. Furstenberg, Dean, University of Michigan Medical School:

"There appears to be no reason why the clinical years should not be taught in a town of 27,000 population, or even smaller. Any state-supported medical school can have legislation passed that will bring patients to the hospital from all parts of the state. This is done in a most satisfactory way in Iowa and I believe in our own State, also."

VII. Specific Recommendations—Capital Outlay and Operating Costs

Your Committee recommends that the Curators lay before the General Assembly the following table of capital outlay and operating costs as the best estimate we can make of the needs for the program herewith recommended:

1. Capital Outlay
   a. Medical School—for a Medical School enrolling 300 students (graduating 75 each year), our present plant supplies about 20 per cent of the need—the sum needed to expand this school to the required size is.. $3,625,000.00
   b. Teaching Hospital—with the present beds available, the University needs a hospital of 600 more beds, making a total of 750 beds. At present estimates, the sum required for a 600-bed hospital is $12,000,000.00. If, as we are informed, funds could be received under the Hill-Burton Act for this number of beds on a 50 per cent matching basis, the sum required is.... $6,000,000.00
   c. Residence for Nurses and Hospital Personnel. Our present facilities would require considerable expansion to take care of hospital personnel. Such facilities are necessary regardless of location of the hospital. Our estimates indicate that such expansion to accommodate 300 additional persons would require an outlay of $1,350,000.00. If, as we are informed, 50 per cent matching funds would be available under the Hill-Burton Act, the sum necessary is.... $675,000.00

   Total capital outlay required for additions to the medical school to accommodate 300 students, an additional 600 beds in the hospital and a residence hall for additional hospital personnel $10,300,000.00
2. Annual Operating Budget
   a. Medical School—the annual requirement for a school of 300 students with allied curricula and a continuation education service for physicians of the state would be, during the ensuing years ..... $800,000.00 per year

   The Teaching Hospital. Based upon the per diem cost per patient in the University for 1948-49 and, on the basis of 80 per cent occupancy, assuming that fees from paying patients would cover about 20 per cent of the cost, the annual sum necessary is, per year $2,831,360.00

   Part or all of this sum might be recovered by the State from local units of government sending indigent patients to the hospital. In any event it is clear that this cost should not be charged to medical education.

   Total annual operating budget necessary for medical school and hospital, per year $3,631,360.00
3. Source and Allocation of Funds
   a. Source of Funds. Since it is clear that the various institutions and services of the state should not be forced to compete with this program for a share of the state's revenues, the Committee recommends that the Curators respectfully request the General Assembly to provide for both the capital outlay and operating expenses of this program by some special tax or allocation and not out of the annual general revenue fund of the State.
   b. Budget. Since medical education necessarily involves assuming the cost of an expensive program involving a large teaching hospital, the cost of which should not be charged to medical education, the Committee recommends that the Curators insist that funds necessary for the program should not be included in the general University appropriation but in a special allocation earmarked for this purpose only. Education in other fields should not be forced to compete for funds in the same budget with an expensive program of this nature.

VIII. Specific Recommendations—Appropriation Request to the General Assembly

The Committee recommends that the Curators request the General Assembly which meets in January, 1951, to make available to the Curators in a special budget and from funds other than the general revenue, the following sums for the biennium 1951-53: (operating funds are reduced since much of the space will not be available during part of the biennium):

1. Enlargement of Medical School Building, $3,625,000.00.
2. Enlargement of the Teaching Hospital, $6,000,000.00.
3. Residence for Hospital Personnel, $675,000.00.
4. Operating Budget for the Medical School, $1,200,000.00.
5. Operating Budget for Training Hospital, $500,000.00.

IX. Specific Recommendations for Immediate Action

1. The Committee recommends that the Curators take immediate action to consult with the proper state agencies looking toward development and presentation to the General Assembly of a plan for making medical services available in the University Hospital in accordance with the needs of the State, the existing programs of hospitals and other public agencies, sound medical practice, and the instruction and research functions of the medical school.

2. The Committee recommends that the Curators publish a report which sets forth the University policy, approved herewith, and a plan of action which citizens of the state may discuss and support. In 1945, the Curators declared their policy which is hereby reaffirmed. Since this policy cannot be implemented apart from some program of statewide medical services, and since other groups in the state have not, as yet, presented such a plan, it is recommended that the Curators assume herewith the leadership, along with other proper public agencies, in preparing such a plan for consideration.

Respectfully submitted,
JOHN H. WOLPERS,
ROSCOE ANDERSON, *Chairman.*

RE-ESTABLISHMENT OF A FOUR-YEAR MEDICAL SCHOOL OF THE UNIVERSITY OF MISSOURI.

By GLENN W. HENDREN, M.D.,
Member of the Board of Curators

A Report to the Board

Being a dissent from the view of the majority of the special committee appointed to reappraise all the factors entering into the proposed re-establishment of this school.

INTRODUCTORY

Since June of 1949, our Committee, composed of Mr. Roscoe Anderson of St. Louis and Mr. John Wolpers of Poplar Bluff, in addition to myself, has undertaken a

detailed study of the whole question of medical education in Missouri.

It was recognized at the outset that our work was to examine the question afresh, that it was to have no relation to positions previously assumed on any of the issues and no relation to any of the controversies which from time to time have arisen.

To aid us in making this objective re-examination of the whole question, the Committee unanimously agreed to retain the services of Harold S. Diehl, M.D., Dean of the Medical Sciences, University of Minnesota. Dr. Diehl's stature as an authority on medical education was recognized by all of us. Since he undertook our study, Dr. Diehl has been retained by the Council on Medical Education to conduct an exhaustive survey of medical education in certain European countries. He has been appointed also to an advisory committee of the United States government to advise on questions growing out of the induction of physicians into the armed forces under the Selective Service Act.

I stress the qualifications of Dr. Diehl at the outset of this report, because from the very beginning of the work of our Committee, all of us, I believe, have had the greatest confidence in his competence, and have been certain that his report to us and to this Board of Curators would be based on a disinterested and thoroughly objective presentation of the facts. Dr. Diehl has no interest in this matter beyond the welfare of this University and of the people of Missouri.

It is important to bear in mind that Dr. Diehl was instructed by our Committee at the start of his work to make no recommendations, but simply to present the facts on which sound decisions could be based. In the substance of this minority report, I rely upon these facts of Dr. Diehl, which seem to me the best data assembled on the question so far. Here, for the first time, I believe we have such facts uncolored by any element of partisanship.

I want further to emphasize that my only interest in making this report is my concern for Missouri's urgent need for a practical and effective program of medical education within the State University. I am a doctor—a country doctor. I see this problem with a doctor's eyes and with a keen awareness of the needs of Missouri people for more medical service. These needs will not be met unless more young Missouri men and women receive public medical education and receive it within our own State.

As a doctor in private practice in a small community, I find it difficult to give the time and effort necessary to urge effectively what I deeply feel is the only sound way of proceeding with this new school. I want, however, to go on record with the assertion that, to the best of my ability, I shall present again and again the facts of this situation, as developed by the expert medical educator retained by our Committee, and as confirmed by my own common-sense knowledge of the needs of the people of Missouri.

In concluding the introduction to this minority report, I should like to make it clear that my position in this matter has no relationship with any conclusions or policies previously announced by the Missouri State Medical Association, or by any other group in the State. In this matter, I am acting as an individual doctor and as an individual member of the Board of Curators.

Areas of Committee Agreement

Perhaps the most important thing about the study of our Committee was the fact that all members agreed on the basis of our exhaustive investigation that the University of Missouri and the State of Missouri need a four-year medical school. It is in the light of our agreement on this basic principle that my report is written. I believe that the course advocated by the majority of the Committee is, in realistic terms, a course that can have no other effect than to make impossible the establishment of a medical school worthy of this University and comparable to the schools supported by our neighboring states.

It is my purpose in this report to urge upon the Board of Curators a most careful evaluation of all the facts as they have been reported to us under present-day circumstances by our eminent adviser, Dr. Diehl.

I cannot escape the conviction that if every member of the Board will seriously consider the objective facts cited by Dr. Diehl, our action will be such as to make possible in the very near future the successful establishment of the medical school, on the need for which your entire Committee is in unanimous agreement.

Areas of Committee Disagreement

The chief point upon which I disagree with my colleagues on this Committee is what seems to me their disregard of the importance of the most prudent utilization of all the State's resources for the support of medical education. At a time when nearly every medical school in existence—no matter how well endowed or supported—is having the greatest difficulty in finding resources adequate to the maintenance and development of its teaching and research programs, I believe we in Missouri would be foolish to establish a new school in such a way as to make it impossible to use the State's best available resources for the school's support and development.

At best, the demands of present-day medical education and its allied programs of research place a very great strain on resources available for this purpose. Nothing could be more unrealistic than to undertake the establishment of a school on a basis that, by its very nature, would cut the school off from a large volume of the State's existing resources for the support of medical education.

These resources are more than available money. They include:

A. Existing pools of patients for medical teaching.

B. Existing pools of skilled clinicians to serve as instructors.

C. Existing physical plants available for medical education.

The majority of our committee in their recommendation to this board have, it seems to me, ignored the essential importance of all the above resources, which are present naturally and without special and costly arrangements in a metropolitan area. (See Enclosure No. 4.) The necessity for duplicating such facilities in a small town would impose at the outset a heavy and unnecessary drain on the resources of the State for support of the school.

To the extent that it would be possible, and this would be to a very limited extent only, to reproduce the above resources in a small town, the people of Missouri would have to be asked to pay a very much larger cost in dollars and cents both initially for the establishment of the school and continuously each year thereafter for its maintenance.

Even at this extremely high and unnecessary cost (which Dr. Diehl has reduced to actual dollars and cents figures), a school located in a situation remote from the existing and natural resources of the State for medical education would almost certainly never overcome its

initial handicap. It is most improbable that such a school would ever achieve or maintain the high standards within the reach of an institution more advantageously located. The expenditure of money—no matter in what amount—would almost certainly never overcome the disadvantages of the small town location.

To put the school in Columbia would be to invite immediate difficulty with accreditation boards and a continuing problem maintaining the school on an accredited basis.

To put the school in Columbia would be to cut off all reasonable possibility of expansion to meet future needs in the State. This limiting factor of the Columbia location has particular relevance at this time, when a growing national emergency already seems likely to demand the education of the largest possible number of doctors.

If any thought should be given to the possibility of establishing a school at Columbia on a reduced scale commensurate with the resources of the campus site, not only would the school be inadequate for possible future needs, but it would not even meet the needs of the immediate present. To provide for teaching a class of, say, 60, would give a net increase of about 20 doctors to the State each year. This result cannot possibly justify the large expenditure involved.

Finally, to strain the State's resources to locate the proposed school at Columbia can have no other effect than to make unnecessary drains on money resources available for improving our facilities for medical care generally throughout the State. A good illustration of this is the fact that construction of the hospital facilities required in Columbia would take the total state share of Federal hospital construction funds for several years to come. The direct result of this would be to deprive many communities in urgent need of hospital and medical care facilities of their opportunity to share in the Federal program.

The above considerations briefly summarize the principal points which have led me to differ with the majority of the Committee.

In considering all the resources available for the establishment of a medical school for Missouri, we must, first and foremost, relate our thinking to the continuing excellence and development we wish that school to attain in the service of our State.

The question of the location of the school is not in itself of intrinsic importance. Personally, I have no absolute preference for any particular locality over any other. It is apparent, however, from Dr. Diehl's study, and from ordinary observation, that this question of location derives enormous importance when considered in terms of the best utilization of Missouri's resources for medical education—both money resources, and others enumerated above.

It is against this background of larger considerations involved that I am compelled to disagree with the other two members of this Committee on the question of location.

The Issue of Location

At this point, I wish to emphasize again that I approach the question of the proper location for our proposed school without any reference to previous controversy on the point, or to positions previously assumed by the Board of Curators, the Missouri State Medical Association or any other group. I wish further to re-emphasize that my interest in the question of location is concerned solely with location as a factor in the wise utilization of all available resources for the establishment of a school that will do the job we expect of it. This job is well defined by Dr. Diehl in his summary of his study (Page 214), in which he states that a State University medical school, among other things, should provide for the following: (A) The undergraduate education of physicians, (B) The training of specialists, and (C) The continuing education of physicians in practice.

It is my view that the data assembled by Dr. Diehl conclusively indicate, beyond any reasonable doubt, that the resources of the State of Missouri can best be utilized in a major center of population for the establishment of a school that will most effectively achieve the above objectives.

(A) *The Undergraduate education of physicians.*

Let me specify by further reference to Dr. Diehl's report. In his discussion of the campus location, he cites as a disadvantage that " 'In certain university teaching hospitals the student is not exposed to a sampling of the common illnesses of man.' " He states also, "In establishing a 1000-bed university hospital, the State and the University must realize that they are assuming a major and continuing financial responsibility for medical care, and that in a small community, even with a large teaching hospital, there remains the problem of providing for medical students adequate experience with certain types of conditions and illnesses. Prominent among these are accidents, contagious diseases, acute illnesses, obstetrics, well baby clinics and community health services," and to this, might be added acute illnesses of children.

(In this connection, it is important to bear in mind not only the program of medical education, but the rights and convenience of patients. Even indigent patients will certainly be reluctant, in many instances, to be hospitalized at long distances from their homes. This is particularly true in the case of sick children, whose mothers may naturally be expected to wish to have them treated at hospitals where they reside. Few families, moreover, will be willing to have mothers taken long distances for obstetrical care. The universal experience of medical schools located in small campus communities bears out the importance of this point. Students have very small opportunity to see acute illnesses of children and an adequate number of obstetrical cases.)

Dr. Diehl further states, "Municipal hospitals in large urban areas make available for teaching purposes patients with certain illnesses and emergency conditions that are seen only rarely, or in small numbers, in hospitals, even large university hospitals, in small communities. An active outpatient department associated with a general hospital in a large city also is a great asset for medical teaching. In fact, some types of medical teaching are best done in an outpatient department. It is here that medical students get experience with the types of patients that physicians ordinarily see in an office practice."

In this connection, Dr. Diehl says elsewhere, in commenting on the campus location, "To have an outpatient service in Columbia large enough to be of any teaching value, some sort of housing for the patients of the outpatient clinics would need to be provided." Here is a very important illustration of the way in which an unwise choice of location could place an impossible demand on the total resources of the State for the maintenance of an excellent medical school. For the University to provide this needed housing for outpatients would be a serious—and from the point of view of medical education—unnecessary expense.

In commenting on the availability of clinical teaching material in Columbia, I should like to add an observation of my own. It is true that the Ellis Fischel Cancer Hospital would make available at the campus location a

number of teaching patients. The fact is, however, that the overwhelming majority of these patients are persons suffering from advanced cancer conditions. The palliative care indicated for most such patients has a minimum value in teaching. Of infinitely greater importance to medical students is experience in cancer detection and early care as is demonstrated daily in outpatient departments of existing metropolitan hospitals.

The maintenance of an effective teaching hospital in Columbia, would, in Dr. Diehl's view, involve still further disadvantages. He says, "In view of limited transportation facilities into Columbia, it might be necessary in order to operate a 1000-bed hospital there, to develop a state-wide ambulance service, similar to the one which is maintained by the University of Iowa hospital."

As I have already noted, Dr. Diehl recognizes that the task of bringing a sufficient number of teaching patients to a 1000-bed hospital in Columbia would involve the State in "a major and continuing financial responsibility for medical care." It cannot be too strongly emphasized that we are here concerned with a question of State policy that is only indirectly related to medical education. It is not, in my view, the function of our Board of Curators to initiate fundamental changes in State welfare programs. This is the function of the Legislature and of the State Board of Health. We imperil successful attainment of our primary objective, which is the establishment of a creditable program of medical education, if we make our planning contingent upon legislative decision to initiate a new, extensive and costly system of State responsibility for indigent medical care.

The above quotations from Dr. Diehl's report, and my supplementary comments, are indicative of the essential disadvantage of a campus location insofar as the objective of educating physicians is concerned.

Let us turn, now, to some of the positive educational advantages cited by Dr. Diehl, as growing out of an urban location for the school. Dr. Diehl states, "Most important among these advantages are the extensive clinical facilities immediately available to the medical school for both undergraduate and graduate medical instruction." Proximity to a Veterans Administration Hospital (in a major population center) would be of great value to the school. As Dr. Diehl puts it, "The experience of other medical schools with similar Veterans Administration hospitals indicates these hospitals can be a great asset to undergraduate medical instruction, as well as to graduate residency programs." Proximity to a mental health center and psychiatric hospital facilities, available in large population centers, would, in the words of Dr. Diehl: "provide excellent facilities and staff for the training of medical students, of physicians and of specialists in psychiatry." (In this connection, it is important to point out that the institution at Fulton, which would be available to a school on the campus, is for patients who have far-advanced mental illnesses, and who would, therefore, not provide the typical case material that is so essential for undergraduate teaching. In the teaching of undergraduates, only a small number of patients with far-advanced mental disorders are desirable. It is much more important to provide a large number of patients with a wide range of disorders in typical early stages of psychosis or neurosis).

In commenting on the relation of urban location to undergraduate teaching, Dr. Diehl emphasizes the importance of having "able and interested physicians . . . available to serve as clinical teachers in the medical school on a volunteer, part-time basis. . . . Having had experience in the practice of medicine, such teachers are able to make a valuable contribution to the training of medical students." On this point, Dr. Diehl comments further: "For clinical departments, instructional costs are uniformly higher in medical schools located in small communities than in schools in urban areas. This is due to the fact that in small communities the medical school must have large staffs in the clinical departments, not only for teaching, but also to care for the patients in their teaching hospitals, and since few, if any, clinical teachers are available in small communities on a part-time volunteer basis, the school must provide this staff on a full-time salaried basis."

(B) *Graduate education of specialists.*

On this point, Dr. Diehl asserts that urban facilities "offer a splendid opportunity to a medical school to assume leadership in the development of graduate training programs in the various specialties of medicine. Such leadership is clearly one of the responsibilities of a state university medical school. Furthermore, when a medical school is in a metropolitan area, some of the graduates of these programs are able and glad, during the years that they are building their practices, to render valuable service on a part-time basis in the University's teaching and research programs."

(C) *The continuing education of physicians in practice.*

All who have considered Missouri's need for a medical school have been aware of the importance of a continuation education program for doctors over the State. Dr. Diehl says: "A recently emphasized responsibility of a state university medical school is to provide continuation study programs for the physicians of the state. Experience has shown that it is easier to develop such programs in urban areas than in small communities. Among the reasons for this is that in a large city the clinical facilities are more extensive, hotel accommodations are better, and the teaching programs can be shared by the part-time clinical staff of the medical school. Medical schools in a small community, with exclusively full-time teaching staffs (as would be essentially the case in Columbia) find it exceedingly difficult and burdensome to conduct continuation study programs in addition to their responsibilities for undergraduate medical teaching, for research and for the medical care of the patients in their large university hospitals."

As a country doctor, I believe I am in a good position to emphasize to the Board the urgent importance of the medical school's responsibility for an effective program of continuation education for the practicing doctors of the State. No other activity of the school will have a more immediate or more direct influence in improving the standards of medical care throughout our State and in enabling all our doctors to practice better medicine.

I cannot escape the feeling that Dr. Diehl gives sound reasons for believing that this essentially important function of the school could not effectively be carried out if the school were located in Columbia.

(D) *Other general considerations.*

In addition to the comments of Dr. Diehl on this subject of location as it directly affects all three levels of the educational program which I have discussed above, he makes a number of general observations based on facts which also demonstrate beyond all question the fact that the resources of our State for medical education can be fully and effectively utilized only in a metropolitan area.

Among these is the matter of cost in dollars and cents. In itself, this matter is not perhaps of controlling importance, but it would be unrealistic not to face it squarely. We may be confident that the Legislature and the taxpayers of Missouri will so face it. The construc-

tion cost of establishing the school in Columbia is set by Dr. Diehl at at least $24,500,000. The equivalent cost of establishing the school in a suitable metropolitan area is set by Dr. Diehl at $10,500,000. It is the order of difference between these two figures that need concern us. Elimination of certain facilities deemed desirable by Dr. Diehl might be possible in either location, but the proportionate difference in cost would remain.

Dr. Diehl points out that of the two total figures given, $7,500,000 might be provided by the Federal government under the Hospital Construction Act toward the cost in Columbia. The construction of smaller hospital facilities in a suitable metropolitan area, Dr. Diehl estimates would bring a contribution of $3,000,000 from the Federal government. At this point, I believe a consideration of basic importance arises. If part of our concern in establishing this medical school is to provide better medical care in Missouri, it would seem in some degree self-defeating for the University to absorb for this purpose the State's entire share of Federal hospital funds over a period of several years to construct a 1000-bed hospital, which is far in excess of the needs of the area in which it would be located. The effect of this would be to deprive many Missouri communities—urgently in need of assistance to build hospitals—of their opportunity to share in allocated funds. It is generally agreed that the provision of improved hospital facilities in smaller communities throughout the State is absolutely essential for bringing better medical care to all citizens. To put it bluntly, would we not to some extent defeat our purpose, if, by providing a medical school at Columbia, we produced doctors, who, on graduation, would find no adequate hospitals in their home communities to which they could return to practice the medical science our University had taught them? It is generally recognized that present-day medical graduates are reluctant to practice medicine in communities without modern hospital and laboratory facilities.

Turning from the question of initial cost, let us note the estimates of Dr. Diehl for continuing costs of operation in both sorts of location.

The annual support required from public funds for the operation of the school at Columbia is estimated by Dr. Diehl at $4,890,000, and the equivalent cost in an adequate metropolitan area at $1,915,000.

Here, perhaps, is the place to emphasize again a point made earlier in this report. Of the total annual cost at Columbia, the sum of $3,750,000 would be required for the support of the University teaching hospital. As Dr. Diehl indicates, the total ultimate cost of this activity would undoubtedly be much greater. He has noted the probable need for a costly ambulance service, and he has also noted the almost certain need for providing of housing facilities for patients in the outpatient department.

Dr. Diehl correctly points out that the unpredictable costs of all these annual charges is not properly chargeable altogether to medical education. He recognizes that the State and county governments would be required to contribute a substantial part of the cost for the medical care of their indigents.

The fact remains, however, that a decision by this Board to locate the school in Columbia would make these total annual costs necessary and all of this would have to come from tax funds. The effect of this would be the anomaly of the Board of Curators of the University of Missouri, in effect, dictating to the State and county governments the welfare policies they are to pursue. I cannot emphasize too strongly my belief that this is a matter not within the competency of this Board. We do have the right—and the exclusive right—to decide what sort of a medical school Missouri is to have. We cannot exercise this right, however, in a way that requires special action by other governmental units to make our decision effective. Finally in this connection, since the function of a university is primarily educational, we should make a serious mistake in developing any school on a basis that would make its ability to carry out its educational activity dependent on public welfare policies subject to change with changing political philosophies.

In the present case, the facts of the Diehl report make it clear that there is no need for the University to enter upon this dangrous ground in carrying out its educational function. The social policies of the State of Missouri are a matter with which this Board of Curators has no connection whatever, and to assume responsibilities in this field is to put ourselves outside the realm, not only of our authority, but our competence.

Another factor of real importance relative to the question of location is cited by Dr. Diehl, who notes, "A practical problem frequently encountered in operating a large hospital in a small community is the difficulty of obtaining the nurses, the technicians and the service personnel required for such an institution." Commenting further on the location at Columbia, Dr. Diehl states: "The advantages of a central location are reduced, if there are transportation difficulties, and the normal flow of business and population traffic is in another direction." Dr. Diehl points out that many university hospitals, notably in Minnesota, Kansas, Illinois and Michigan are not in central areas of their respective states.

Another most important consideration is the influence of location on the availability of supplementary funds for the medical school program. "The difference between a good medical school," Dr. Diehl points out, "and a truly distinguished one, frequently depends upon support for its activities beyond that which can be supplied by its basic budget. Such support may be for buildings, for special laboratories and equipment, for the support of research, for the development of special institutions, for training programs such as industrial hygiene and public health, or for the endowment of special professorships. The possibilities of obtaining gifts and bequests for such purposes are much better in an urban community than they are in a small town." Dr. Diehl goes on to note that most of the gifts and bequests received by the University of Minnesota "have come from the residents of the City of Minneapolis, in which the medical school is situated," and I am sure the same could be said for Washington University Medical School in St. Louis.

In concluding my comment on this matter of location, I should like to quote once more from Dr. Diehl's report, with whose view I concur completely, when he says: "It would be a major calamity to have the decision be made on any basis other than an objective appraisal of the situation, without regard to past controversies, or to pressures or political influence that may seem to be operative at the present time."

As I have endeavored to make clear again and again, we can make a wise decision in this matter of location only by the clearest and most objective analysis of the facts. In this connection, I think we should be wise to take into account the actual experience of our neighboring states. No matter how carefully we may reason or evaluate general considerations, our conclusion ought still to be tested by the actual experience of schools in similar situations. This reference to experi-

ence, it seems to me, further confirms the importance of a major city location.

Our neighboring states, Illinois, Tennessee, Arkansas, Oklahoma, Kansas and Nebraska, have all concluded that the proper solution of this problem is to have the State University medical school in a populous center, although the University proper is located in a small town. Of these states, Illinois, Nebraska, Kansas and Tennessee have located their medical schools in major centers of population on the extreme peripheries of their respective states. So far as I have been able to determine, none of these schools have suffered any serious disadvantage because of this location, and, in the notable case of Kansas, a national reputation has been achieved for the school in its service to the State, particularly to rural areas.

Before leaving this topic, a word may be said of some of the schools located in small campus towns:

(A) *The University of Iowa medical school at Iowa City, Iowa.* Operation of this school, particularly the cost of providing clinical material, is a continuingly serious financial problem for the State. At the time the school was established, Iowa City was one of the largest cities in the State. The school's development is to a large degree the result of a generous grant from the Rockefeller Foundation as part of its initial capital investment.

(B) *Duke University at Durham, North Carolina,* similarly owes its development in a small town to a heavy endowment by the Duke family.

(C) *The University of Michigan at Ann Arbor* is really not in a situation comparable with Columbia. Within a radius of 30 miles of Ann Arbor, one third of the total population of the state of Michigan resides.

The overwhelming weight of the evidence makes inevitable the conclusion that the typical state university medical school has a better chance of success in a metropolitan area than in a small town community. I believe that we, as Curators of the University of Missouri, have a fundamental obligation to give this new school the best possible chance to succeed.

RECONSIDERATION OF POINTS IN THE JULY, *1945*, STATEMENT OF ACTION BY THE BOARD OF CURATORS, ENTITLED "MEDICAL SCHOOL AND RURAL HEALTH."

Beginning on Page 9 of the Curators' statement are listed fourteen reasons on which the Board at that time based its conclusion that the school should be located on the Columbia campus. In the light of the fresh view of the circumstances which the Curators have obtained by the study of this Committee, and from the independent view of the whole problem by Dr. Diehl, acting for the Board of Curators, I think it only appropriate that these former views expressed by the Board be specifically re-evaluated. Let us consider these reasons briefly, one at a time. (See Enclosure No. 5.)

1. *"Only by having the four year medical course at Columbia may the fullest development of a program of medical and health extension service, with particular emphasis upon rural areas, be developed."*

I believe Dr. Diehl has emphatically brought to our attention the heavy responsibility accompanying the establishment of a hospital in Columbia to care for patients brought from all over the State. In my earlier comments on this point, I have sought to emphasize my view that in this area the Curators' 1945 position represented to a serious extent a departure from primarily educational considerations and an encroachment on the area of State policy for welfare.

Dr. Diehl's indication of the costs and complexities to which such a development would lead seems to me to provide us now with the occasion for re-examining critically this position adopted by the Board in 1945.

It cannot be too strongly emphasized that the experience of our neighboring states, Illinois, Kansas, Tennessee and Nebraska, demonstrate that a central location is not essential to permit a medical school to make its full contribution to the service of the state.

2. *"The training of doctors at a medical school in a University Community the size of Columbia will be far more conducive to their settlement in rural areas than if they are trained at a medical school located in a large city."*

In the 1945 statement, the Curators supported this opinion on an undocumented personal view expressed by Dr. Alan Gregg. This view of Dr. Gregg's needs re-evaluation in the light of the very specific conclusion of Dr. Diehl, which he bases on an actual analysis of the location of graduates of the University of Minnesota Medical School over a period of 15 years. Dr. Diehl concludes most emphatically that in the choice of where a doctor will practice, the medical school, if a factor at all, "is certainly a minor one." Dr. Diehl's report shows that: "Sixty per cent of the graduates who grew up in communities of less than 5,000 population, returned to practice medicine in communities of similar size, while only 29 per cent of the students who grew up in large cities established practices in rural areas. In other words, the chances are more than twice as great that a medical student who has grown up in a rural community will practice medicine in a rural area than that a medical student who has spent his life in a large city will establish practice in the country. A conclusion that can be drawn from this is that one effective way to increase the number of physicians in rural communities is to increase the number of medical students from rural areas."

In the light of Dr. Diehl's data and conclusion, it would appear that the Columbia location would have little, if anything, to do with inducing more doctors to settle in rural Missouri. This is a second element of the Curators' 1945 position that today requires reconsideration.

3. *"The central location of Columbia and its excellent highway connections with rural Missouri make it the most logical and convenient location for a medical center for rural Missouri."*

We have already considered at length the distinction between establishing a medical care center as part of a State welfare program and establishing a medical school. This need not be elaborated further. It is important to note that Dr. Diehl, as a result of his study, entertains very grave doubt as to the excellence of Columbia's transportation connections with the entire State. He concedes on Page 212 of his report that "Columbia, as the geographic center of the State should, theoretically at least, provide an ideal location for a large State hospital." He then comments as follows: "On the other hand, the advantages of a central location are reduced if there are transportation difficulties and the normal flow of population and business traffic is in another direction."

Below, on the same page, Dr. Diehl states: "In view of limited transportation facilities into Columbia, it might be necessary, in order to operate a 1000-bed hospital there to develop a statewide ambulance service. . . ." It is apparent to me that Dr. Diehl entertains no illusions on the point that there will be a natural flow of teaching patients in sufficient number into Columbia.

I can read his report in no other sense than as a warning to the Board of Curators to exercise great care on this point and as a warning not to conclude that a geographic center is by nature a potential medical center. In the light of Dr. Diehl's expressed reservation, this point is another of the 1945 conclusions that requires critical re-examination.

4. *"The State already has made a large investment for medical facilities at Columbia."*

In Dr. Diehl's analysis, he concludes that a building for medical teaching and research will be required in Columbia. He concludes further that a 1000-bed hospital will be required, together with a nurses' home and a student dormitory. In addition, he calls attention to the probable need of housing for patients in the outpatient department of the hospital. In other words, Dr. Diehl makes it perfectly plain that a total plant will have to be constructed in Columbia.

He states: "In Columbia, the only existing hospital beds that could be considered satisfactory for undergraduate medical teaching are those in the Ellis Fischel Cancer Hospital and in the Crippled Children's Unit of the University Hospital. University students and patients of private practitioners cannot be utilized satisfactorily for undergraduate medical teaching. These two units could make available about 100 teaching beds. This is approximately the number of beds that should be provided in a university hospital for the private patients of the members of the full-time medical school staff. Therefore, if the medical school is established in Columbia, it will be necessary to construct a university hospital of 1000 beds, as well as an affiliated and adequate outpatient department."

Dr. Diehl specifically points out that the present University hospital is not suitable for teaching purposes. There would be no loss to the University in transferring McAlester Hall to other purposes. In final comment on this point, we may ask whether it is intelligent economy to spend $24,500,000 to take advantage of an existing plant so minimal as to be almost worthless, when, for the expenditure of substantially less than half this sum, the same result could be achieved elsewhere.

In view of Dr. Diehl's exhaustive analysis of comparative costs, this economic argument presented in the Curators' 1945 statement seems no longer relevant.

5. *"The University location presents to the faculty and students of medicine the invaluable asset of close contact with the fundamental sciences of physics, chemistry, biology, and the related sciences of psychology, anthropology and sociology."*

In commenting on the question of basic medical sciences and related sciences, Dr. Diehl notes—and again with an emphasis most pointed, in view of the Curators' 1945 position—"The amount and the importance of duplication in teaching staff and facilities if the medical school is in a separate location, is too small to be of much concern."

There is very little evidence of co-ordinated interdepartment research on the campus of University of Missouri at this time. Any metropolitan area in which it would be advisable to locate a medical school, would give an equivalent opportunity for fruitful contact with specialists in allied scientific fields.

6. *"The University location develops the educational interrelationships of the medical division."*

It may be readily admitted that, if all other considerations were equal, it would be to the advantage of the University to locate the school on the campus at Columbia, and that a fruitful interrelationship with other University departments would result. The fact, however, that Dr. Diehl gives merely passing mention to this consideration in his detailed study of the major factors involved in this problem, suggests his recognition that this is, in fact, a secondary and not a central consideration. To attach controlling influence to it would be to sacrifice the essential interest of the school we propose to establish for secondary and indirect benefits to other University departments.

As a practicing physician, and a graduate of the University of Missouri school, I concur with Dr. Diehl's apparent view of this consideration. Certainly in the light of the primary objectives for which the school is to be established—and particularly in the light of the present day economic factors cited by Dr. Diehl—this 1945 element of the Curators' position requires a most critical re-evaluation. It needs to be seen in its right relationship of secondary importance to the main job we have to do.

7. (This point related to a divided medical school, which was a point not considered by our Committee, and which is no longer an issue as there is general agreement that all four years of the school should be conducted at one location.)

8. *"If the students in medicine are to obtain the best medical education, it is imperative that the University have control over the management of the principal teaching hospitals in which the larger part of the clinical training is to be given."*

On this point, we have again the expert testimony of Dr. Diehl, supported by the practical experience of many first rank medical schools that use public hospitals for teaching. In this particular case, Dr. Diehl states that: The metropolitan city hospital, "which has been offered to the University for a teaching hospital, ranks well among municipal hospitals of the country. In fact, it is a surprisingly good institution for a hospital without university affiliation. . . . Under the contract offered to the University of Missouri," Dr. Diehl continues, "the professional services of this hospital and its outpatient department would be completely under the control of the medical school. A comparison of this contract with contracts between other medical schools and municipally supported teaching hospitals shows it to be very satisfactory to the medical school. . . . It has been stated, also, that the entire medical staff of the municipal hospital has offered to resign if the medical school takes over the hospital for teaching purposes, thereby giving the medical school complete control of its teaching staff."

It is important in this connection to emphasize that a metropolitan location would make available immediately men of eminent national reputation as part-time teachers, and the school, from its very beginning, would have the advantage of a nucleus of distinguished faculty members.

In addition to Dr. Diehl's re-examination of this matter since 1945, the Veterans Administration since that time has entered into arrangements for use of Veterans Administration hospitals by state university medical schools for teaching purposes. Of such arrangements, Dr. Diehl says: "The experience of other medical schools with similar Veterans Administration hospitals indicates that these hospitals can be a great asset to undergraduate medical instruction, as well as to graduate residency programs." This statement of Dr. Diehl's is strongly confirmed by a letter addressed to me on October 5, 1950, by Dr. Paul B. Magnuson, Chief Medical Director of the Veterans Administration, Washington, D. C.

In his letter, which is attached to this report as En-

closure No. 2, Dr. Magnuson says: "I want to say to you in very strong language, which I hope I can keep in line with the usual formalities, that that has been the plan of the Veterans Administration hospitals ever since General Bradley was made Administrator and the sole reason for my coming to Washington was to assist in the reorganization of the VA Medical Department under this VA Hospital-Medical School affiliation program. We are associated now in 80 of our hospitals with 59 Medical Schools throughout this country. Some of the Medical Schools affiliated are teaching students in VA hospitals at some distance from the Medical Schools or are assuming the responsibility of staffing our hospitals with their faculties. This is the only way, in my opinion, to teach the sound practice of medicine and give medical students an opportunity to see all kinds of cases under all kinds of conditions, under the supervision of good medical men. The thing that most medical schools are short on is clinical teaching in hospitals. We in the Veterans Administration are offering you 500 teaching beds with no financial responsibility to you except the taxes you pay to the National Government. Without an affiliation of this kind this probably would cost the State of Missouri . . . many millions of dollars a year to maintain.

"I not only offer this, but I urge, for the sake of the future practice of medicine, that you keep your Missouri boys in Missouri; offer them an opportunity to get their medical education in Missouri so that they will not have to depend on other states for this; thus encouraging them to remain in Missouri, and take up the practice of medicine there, after completion of their medical education.

"If there is any way in which I can cooperate, you may bank on me 100 per cent."

In view of this specific statement of the Veterans Administration, and in view of Dr. Diehl's careful evaluation of the usefulness of hospitals in metropolitan areas, and also in view of his specific assurance of his satisfaction with possible contractual arrangements, it would seem to me that this particular element of the 1945 statement of the Curators presents very little basis for concern at the present time.

9. *"University associations strongly appeal to men who enter the profession of teaching, and a strong medical school located on a university campus will attract these men more than one detached from this environment, because it assures them facilities and opportunities for the maximum development of their abilities."*

This statement is hardly an objective factual basis on which to rest any conclusion with reference to the location of a medical school. It cannot be disputed that there are many persons who by temperament incline toward a preference for campus life in a small town. It is equally true, however, that a great many persons would, of their own choice, prefer the life and atmosphere of a larger city. The fact that a medical school is located in a suitable metropolitan area will, in many instances, mean greater, and not less opportunity for its faculty to have stimulating contact with scientists in related fields, and, indeed, with men of learning and cultivation in all walks of life.

The assertion is sometimes made that the campus environment is important not only for teachers, but for students in a medical school. The fact is that medical students today, almost without exception, are already graduates of four-year university courses, and their experience of campus living is part of the equipment they bring to their professional course of study.

The medical student, in other words, is a university graduate with his campus interests behind him. The demands of the medical curriculum and the maturity of the men who undertake it are not conducive to active participation in campus activity. Indeed, such students are more interested—and properly so—in opportunities for advancing in experience of their profession. Important among these opportunities is the occasion to serve as externs, to act as laboratory assistants and generally to familiarize themselves with the whole practice of medicine as it is carried on in the wide variety of metropolitan hospitals.

10. *"In a university community, a professor's salary is more likely to satisfy a distinguished teacher than in a community where his associates would be leading practitioners of medicine and surgery, whose incomes are much larger than his."*

The point here raised regarding faculty salaries in a medical school has another aspect—and one probably more important from the point of view of general faculty morale and university administration. This is the fact that clinical professors of medicine command higher salaries than teachers of equal rank in other university departments. If these higher salaries are enjoyed in the campus small town community, it is true they may make some contribution to the satisfaction of the medical faculty. From the point of view of University administration, however, there is a real question as to whether or not this advantage is not more than offset by resultant dissatisfaction in other department faculties. In general, this point in the Curators' 1945 position would seem one very incidental to the main issue, and, moreover, a point that could give this Board as much reason for favoring a metropolitan location as for favoring Columbia.

11. *"The training of doctors in a medical school in a University community the size of Columbia will be far more conducive to their practicing in rural areas than if they are trained in a medical school in a large city."*

The findings of Dr. Diehl on this point, as I have already noted, are conclusive that the location of the medical school is a factor of insignificant importance in determining where its graduates will practice. Dr. Diehl has cited convincing statistical evidence to show that students who grow up in rural areas are likely to return to rural areas to practice medicine. The location of their medical school seems to have almost nothing to do with this decision.

12. *"At the present time there are approximately 60 four-year medical schools that have university affiliations, etc."*

The subject matter presented under this heading is discussed elsewhere in this report, and particularly by Dr. Diehl on Page 211 of his analysis. Aside from the question of a divided school—not an issue here—Dr. Diehl gives the materials a somewhat different emphasis. In the light of all the factors brought out by our Committee's study, there is room for re-examination of this element of the Curators' position of 1945. In this re-evaluation, it seems to me particular emphasis should be given to the experience of university medical schools in states adjacent to Missouri.

13. *"Other highly significant reasons . . . "* (Again it is to be borne in mind we are not concerned with a divided school.)

"a. The long-run higher cost of maintaining a plant separate from the main campus of the university."

In view of Dr. Diehl's estimate that it would cost $4,890,000 each year to operate the school in Columbia and only $1,915,000 to operate the school each year in a metropolitan area, it would appear that this consideration of the Curators' statement of 1945 can no longer be considered.

"b. The administrative difficulties of a divided organization."

On this point, Dr. Diehl comments briefly that administration at a distance from the University campus requires stronger leadership than would be necessary if the school were located on the campus. The argument, however, is not one to which he gives emphasis, and is, in my view, a weak one. We have before us the examples of the universities of Kansas, Illinois, Nebraska, Tennessee, Oklahoma, Colorado and Indiana, to name but a few. In all these states, the governing body and officers of the university have found themselves equal to the task of effectively administering a medical school detached from the main site of the university. Indeed, in Texas, university authorities have successfully administered not one, but two schools of medical science. I cannot believe that the administrative abilities of the officers of the University of Missouri are inferior to the capacities of administrators in neighboring states. As we all know, and as Dr. Diehl emphasizes, many of the outstanding medical schools of the country are administered by state universities at some distance from the university campus. I am confident that we can do this in Missouri. To urge that we cannot, is surely an admission of weakness or laziness, or both.

"c. The limited term contract for the use of hospitals, which places the University in a position where it can be forced to accept the terms offered by the other party, or abandon the State's investment."

Let us consider this point in the light of the figures developed by Dr. Diehl. It is understood that a 35-year contract for the use of necessary metropolitan hospital facilities has been offered to the University. Assume for the purposes of argument that at the conclusion of this term the University were to find itself in the position suggested above. Assume further that, when it was forced to abandon its investment, it was unable to dispose of any of its assets for compensation. Making these double assumptions of the worst possible outcome, which is the present better alternative for the University in terms of money? If the needed plant were built in Columbia, according to Dr. Diehl, the initial investment would be $24,500,000. If it were built in a metropolitan area, the cost would be $10,500,000. The net saving to the University would be $14,000,000 at this time. At the end of 35 years, the most the University could lose would be its total metropolitan area investment. Inasmuch, however, as this total investment would be less than the saving in using the metropolitan area to begin with, it can hardly be considered a loss.

In addition to this consideration is the important one of annual expense. Over a 35-year period, the saving to the State on the basis of Dr. Diehl's figure, inherent in the metropolitan location, would be $2,975,000 a year, or $104,125,000 for 35 years. It would appear from a fiscal point of view, therefore, to be prudent to invest $10,500,000 for a 35-year period for the purpose of saving approximately 10 times this sum. Certainly it might seem imprudent to invest $24,500,000 for the privilege of spending in the small town location $104,125,000 that does not require to be spent.

To turn to considerations other than financial, 35 years is a generation. In this period of time, either our medical school will prove its worth beyond question, or it will not deserve to survive, wherever located. If it does prove its essential worth in the service of the State, we may be confident that no pressures, political or otherwise, will enable any governmental body within the State to force such an institution out of business, or to compel it to pursue policies of which it does not approve.

"d. The lack of control over the hospital to be used as a principal teaching clinic by the school of medicine."

This point has previously been touched on in the reference to Dr. Diehl's comment on the adequacy of the contract offered for the use of metropolitan hospital facilities. Dr. Diehl's report has another element which bears directly on the points we are discussing here, and in the preceding paragraph. He does not recommend that the school of medicine ever be exclusively dependent on hospitals not owned by it. To give it an independent base of operation—no matter what disagreements may ensue with city authorities—he wisely recommends the construction of a 250-bed hospital, a University-owned teaching hospital. Let us see for a moment what this independent base of operation would mean to the University in the event that a metropolitan city government breached its contract, or otherwise made University use of the city hospital impossible. To begin with, ownership of this hospital would provide a minimum nucleus of teaching patients and facilities to permit continuation of the instruction program during any period of adjustment.

It is also important to bear in mind that from this University-owned base of operations, it would always be possible in a major metropolitan center to continue use of a very wide range of hospital facilities in the community, aside from those owned by the municipality. It is hard to conceive of a dispute with a city government which would have the effect of expelling the University not only from the city hospital, but from institutions administered by independent boards of trustees, such as are available in great variety in major metropolitan areas. It is further to be borne in mind that no city administration could in any way affect the availability of Veterans Administration hospital facilities.

The primary importance of this University-owned hospital of moderate size is to provide, as Dr. Diehl points out, facilities for the full-time staff of the medical school to use for patients in whom they have a special research interest. He notes that this is essential if a school is to attract first-rate teachers and scholars in the clinical field.

Even more fundamental reasons for university ownership of its own hospital of moderate size—and it would be foolish to construct one of more than moderate size—are set forth by Dr. Diehl on Pages 207 and 208 of his report.

To sum up, then, it is important that in a metropolitan area the university have ownership of a hospital of its own, both for essential purposes of medical education, and for the special insurance purpose indicated in the discussion here. With this assured base of operation, and with the variety of hospital facilities independent of city control in any metropolitan area, there is no reason to contemplate that the position of the medical school could ever become untenable because of political or other shifts in policy of city administration.

"e. The danger of future political influence inherent in the use of a city hospital controlled by constantly changing administrations."

The proposed contract referred to above is estimated by Dr. Diehl to provide adequate protection against such a contingency. The force of public opinion, moreover, as noted in my comment under "c" above, will also be an important factor here. Our best reliance, however, is probably on the observable fact that such arrangements have worked effectively in other states.

My personal feeling is that the University will be in less danger of having its medical school policies influenced by politics if it operates under a firm contract

with a single municipality than if it involves the operation of the school in a State-wide program of welfare service to State and county agencies. This situation—an inherent part of the proposal to locate the school in Columbia—would be inevitable, as the school would continuously be dependent for its existence on payments from many governmental agencies for the care of indigent patients. The complexities and frustration of negotiating rates of pay for indigent care and of collecting these payments would be extremely difficult. The whole program of the school, moreover, as it would involve a very large annual operating budget, would make it necessary constantly to seek larger legislative appropriations than would have been required in a metropolitan area, and there would constantly be the thought in the minds of the Legislature that the high appropriations sought were needed only because an opportunity for more economical operation of the school had been passed by.

The total of all these considerations leads me to the strong belief that we have much less to fear from political interference if we are operating under the well-defined terms of a legally binding contract with a single municipal government than if our school is constantly dependent on maintaining effective relations with the constantly shifting administrations of State and county government.

14. *"That the medical school should not be geographically separated from the rest of the University is the position taken by leading authorities on medical education and by the most significant authority surveys on medical education."*

To insist on this position is to state that the medical schools in most of the states bordering Missouri are wrongly located. An objective view of the circumstances of these schools does not permit this conclusion.

That the generalization above is by no means the universal position taken by leading authorities on medical education may be determined by a reading of the report by Dr. Diehl, the particular authority on medical education whose services were retained by the Board of Curators for the purpose, not of making a generalization, but of guiding our choice in our particular problem in Missouri.

It seems to me any fair reading of the Diehl report must result in the belief amounting to a certainty that Dr. Diehl, if the choice were left to him, would advocate the establishment of the medical school of the University of Missouri in a metropolitan area. The preponderant emphasis throughout his entire report leads to this inescapable conclusion.

Conclusions and Recommendations

In view of the unanimity of our Committee on the importance of reestablishing a four-year medical school by the University, and in view of all the preceding discussion, which relies in a large measure on the study of the University's own expert, Dr. Diehl, it seems to me most important that this Board of Curators take no definite action on the question of location which would have the effect of putting the whole project in danger.

To accept the majority report of the Committee and affirmatively to state that it is now the policy of this Board to locate the medical school in Columbia would, it seems to me, seriously reduce the likelihood that the necessary funds for a medical school will be forthcoming from the Legislature. I feel this keenly, because I cannot see that an adequate case has yet been made for the relatively very high initial cost, and even higher continuing costs of establishing the school in Columbia.

Then, too, without taking into account the cost of establishing this important part of the University on the campus, I am sure that no matter how much money would be expended by the State on the physical plant, it would be impossible to furnish there the abundance of teaching material already available in other locations. It would also be impossible to utilize the vast pool of existing medical talent that can be had only for the asking. It would be difficult to maintain in Columbia the excellence that would be readily attained in a metropolitan center in postgraduate, continuation education and research projects.

The pressing need for hospitals in smaller communities throughout the State must not be disregarded by our use of all Federal aid now available and probably even that aid available for years to come. To do so would defeat our purpose for educating doctors for rural communities, and, at the same time, deprive the people of rural communities and their doctors of a practical method of caring for their illnesses.

The military is now drawing many physicians from private practice. This process will be accelerated, and more communities will soon be desperate for medical care. A properly functioning medical school could be established in a metropolitan center years before such a center could be obtained in a small community, even though the money were readily available.

For these reasons, I urge the Board of Curators to take no affirmative action on the majority committee report at this time.

It will be noted that throughout my Minority Report, I have not referred to the city of Kansas City by name. This has been done, because I feel the issue is not primarily an issue between particular localities. The issue is between locating the school in a small university town and locating it in a major metropolitan center.

There are two such centers in the State of Missouri. In the enclosures of my report, and throughout the report of Dr. Diehl, the proposal of Kansas City has been presented in detail to this Board.

In all the years this matter has been under consideration, I recognize that St. Louis has shown no interest in having a University of Missouri medical school established there. This may be because it is felt the facilities of St. Louis for supporting medical education are already being fully utilized by the two schools presently there.

The plain fact of the matter, however, is that all considerations point to the certainty that a University medical school, to succeed, will need the full resources of one of the State's major metropolitan areas.

With this conviction in mind, I ask that a committee be appointed and that instructions like the following be given to it:

1. to proceed with a thorough investigation of detailed questions of locating and operating the school in a metropolitan center on the basis of the proposals we have received from Kansas City.

2. to investigate the possibility of locating the school in St. Louis, which is, theoretically, a most important potential site.

The following questions are illustrative of factors that need to be investigated before a decision could be wisely made to locate the school in Kansas City. (If St. Louis should prove to be a potential site, similar questions would have to be answered for St. Louis.)

(1) Investigation of every element of the contract offered by City of Kansas City to determine that the interests of the University are fully protected.

(2) Investigation of the possibility that an existing hospital structure might be acquired in outright ownership to obviate the need for building the structure contemplated by Dr. Diehl.

(3) Exploration of the details of a possible contractual relationship with Mercy Hospital in Kansas City for pediatric teaching.

(4) Full analysis of the value of the new Veterans Hospital in a teaching program.

(5) Study of how the costs of the care of outstate indigents referred to our University hospital in a metropolitan area could best be met.

(6) Blueprinting of a program by which continuation education service would be carried on, utilizing the service of part-time University teachers.

The above are merely illustrations of the numerous important questions which I believe this Board should insist be answered before deciding on Kansas City, or any other location, for our school.

To act, before such questions are answered in detail, would be to invite the possibility of making a serious mistake, and would also be to commit this Board to a course of action, before exercising its maximum bargaining power to assure the best arrangement possible from the University's point of view.

Finally, then, the issue appears to me to be between a metropolitan area as opposed to a small town location. The advantages of the metropolitan area, in general, seem to me to be overwhelming. The matter requires, however, further study by representatives of this Board before it is possible to make a final evaluation of the relative merits of different locations.

I urge the appointment of a committee with appropriate authority to negotiate contracts, assemble pertinent data and prepare definite proposals that, after action by this Board, can be placed in the hands of the proper State officials for legislative action. The possibility of an existing surplus in state funds, together with some small reserve in the post-war fund, suggests that it would be within the realm of legislative ability to appropriate an initial amount of the sum needed for a school located in a metropolitan area. To determine a proper initial appropriation request will require further study. This should be one of the important tasks of the special committee I am recommending.

ENCLOSURES

Enclosure No. 1. A Medical School for the University of Missouri, A Report to a Committee of the Board of Curators by Harold S. Diehl, M.D., Dean of the Medical Sciences, University of Minnesota.*

Enclosure No. 2. Letter of Paul B. Magnuson, M.D., Chief Medical Director of the Veterans Administration, Washington, D.C., addressed to Glen W. Hendren, M.D., dated October 5, 1950.

Enclosure No. 3. Text of the contract offered by the City of Kansas City to the University of Missouri.

Enclosure No. 4. Summary of facilities offered and available in the Kansas City area, including: (a) Teaching beds available; (b) Other hospital facilities suitable for resident and intern training; (c) Pool of qualified medical instructors; (d) Professional societies; (e) Library facilities.

Enclosure No. 5. Medical School and Rural Health Care, issued by The Board of Curators, University of Missouri, July, 1945.

* This report is published in this issue of THE JOURNAL. Enclosure No. 5 is not reprinted.

VETERANS ADMINISTRATION
Washington 25, D. C.
October 5, 1950

Office of
Chief Medical Director
Department of
Medicine and Surgery

Air Mail

Dr. G. W. Hendren
Board of Curators
University of Missouri
Liberty, Missouri

Dear Doctor Hendren:

It is my understanding that there has been some question about whether the Veterans Administration hospitals would be open for the teaching of medical students in Kansas City, if the University of Missouri Medical School were to be located in Kansas City.

I want to say to you in very strong language, which I hope I can keep in line with the usual formalities, that that has been the plan of the Veterans Administration hospitals ever since General Bradley was made Administrator and the sole reason for my coming to Washington was to assist in the reorganization of the VA Medical Department under this VA Hospital-Medical School affiliation program. We are associated now in 80 of our hospitals with 59 Medical Schools throughout this country. Some of the Medical Schools affiliated are teaching students in VA hospitals at some distance from the Medical Schools or are assuming the responsibility of staffing our hospitals with their faculties. This is the only way, in my opinion, to teach the sound practice of medicine and give medical students an opportunity to see all kinds of cases under all kinds of conditions, under the supervision of good medical men. The thing that most medical schools are short on is clinical teaching in hospitals. We in the Veterans Administration are offering you 500 teaching beds with no financial responsibility to you except the taxes you pay to the National Government. Without an affiliation of this kind this probably would cost the State of Missouri or the City of Kansas City many millions of dollars a year to maintain.

I not only offer this, but I urge, for the sake of the future practice of medicine, that you keep your Missouri boys in Missouri; offer them an opportunity to get their medical education in Missouri so that they will not have to depend on other states for this; thus encouraging them to remain in Missouri, and take up the practice of medicine there, after completion of their medical education.

If there is any way in which I can cooperate, you may bank on me 100 per cent.

Sincerely yours,
PAUL B. MAGNUSON,
Chief Medical Director.

AGREEMENT BETWEEN KANSAS CITY AND BOARD OF CURATORS OF THE UNIVERSITY OF MISSOURI, IN RELATION TO THE MAINTENANCE OF A MEDICAL SCHOOL IN KANSAS CITY, MO.

This agreement, made and entered into this .... day of December, 1942, by and between Kansas City, Missouri, a Municipal Corporation, hereinafter referred to as the "City," and the Board of Curators of the University of Missouri, hereinafter referred to as the "University," Witnesseth: That,

WHEREAS, the University desires to establish a department of said institution for the teaching of medicine and surgery which will be known as the University of Missouri School of Medicine, and desires to avail itself of

the hospital facilities of the city by said School of Medicine in the furtherance of its courses of instruction; and,

Whereas, the City desires to avail itself of the skill, experience and research of the faculty of such School of Medicine for the purpose of more perfectly serving the patients of the City Hospitals and elevating the standards of medicine and surgery in said Institutions; and,

Whereas, it is a recognized and desirable practice prevailing in most of the large progressive cities in the United States to combine the City Hospital facilities with the facilities and store of expert and advanced medical knowledge of a recognized School of Medicine for the mutual benefit and advantage of such Medical Schools and the citizens of such cities, and the City and the University desire to enter into such an arrangement for said purposes, and such cooperative action between the University and the City is specifically authorized by the Charter of said City.

It Is Therefore Agreed between the parties, in consideration of their hereinafter specified mutual covenants and obligations, as follows:

1. The City grants to the University, for a period of thirty-five (35) years from the effective date hereof, the use of the facilities of the public hospitals of the City, including the rooms to be used as class rooms, the auditorium in Municipal Hospital Number 1, and the service of the City's laboratories; also space in the City Hall be hereafter more definitely alloted, adequate for office space of the administrative staff of the University, all to be furnished to the University free of charge, and such space and facilities shall include the physical care and maintenance of all buildings and rooms and the supplying of water, heating and utility services.

2. The City agrees, for the period when this Agreement shall remain in effect, to continue to maintain and operate its hospitals at such a level of efficiency and public health service as to satisfy the requirements of Grade A. Hospitals set by the accrediting agencies of the American Medical Association, the Association of American Medical Colleges, and the American College of Surgeons.

3. The City shall continue to operate its hospitals and be responsible for the employment of personnel, including paid nursing staff and laboratory personnel, and for the business administration of its hospitals, and said personnel shall remain subject to the provisions of the City Charter and ordinances respecting the employment, compensation and discharge thereof, except that the appointment of the Medical Superintendent of the hospitals shall be made by the Director of Health only with the approval of the University. Said hospitals shall continue to be operated to serve the needs of such of the public as may be entitled thereto. The University shall not demand so much of the available space in said hospitals as to impair the efficiency thereof for the primary purpose of serving the public.

4. The University shall appoint the attending faculty staff serving in said University and in said hospitals and the faculty and administrative staff required by the University in its teaching and research program, and the salaries of all such persons shall be paid by the University.

5. The University shall have the right to control the operation of the dispensary or outpatient department of such hospitals.

6. The City agrees to provide for the housing and care of all animals used in experiment.

7. The University agrees that its faculty shall constitute a medical staff which shall perform the duties customarily performed by the medical staff of a modern, standard hospital in the service and care of the patients in said hospitals and the patients in the dispensary departments thereof, and shall make available to said hospitals the results of its experimentation and research, and shall likewise make available to the service of said hospital its technical equipment, all without cost to the City.

8. The City will reserve, for a period of five (5) years, a tract of ground fronting approximately two hundred ninety (290) feet on the east side of Locust Street south of Twenty-fourth (24th) Street and approximately one hundred thirty-two (132) feet deep, described as Lots 15, 16, 45, 46, 47, 48, 59, 60, 61, 62, 63, 64, Walnut Lawn, a Subdivision in Kansas City, for the use of the University for the construction of a University building for its School of Medicine. Within such time and within such later time during the life of this Agreement as the City has not devoted said tract of land to its own purposes the City will lease said tract to the University for a rental of One Dollar ($1.00) per year conditioned upon the University constructing thereon such University building.

9. In the use of the hospitals for the instruction of medical students, the University will allow students of other approved medical schools entry and access to such hospitals in conformity with the present practice insofar as such entry and access will not substantially interfere with the program and efficiency of instruction of the students of the University; provided, however, that this provision shall not be interpreted to require the offering of instruction to such medical students of other institutions.

10. This Agreement shall be in effect for a period of thirty-five (35) years from the effective date hereof when approved by the parties and the Council of Kansas City, Missouri, but it may be terminated by the University by written notice from the president of said Board of Curators whenever the City, for a period of ninety (90) days, shall have failed to perform its obligations hereunder, and said agreement may be terminated by the City upon written notice from the Director of Health of said City by authority of the City Council whenever the University, for a period of ninety (90) days, shall have failed to perform its obligations hereunder, each of said notices of termination to be effective ninety (90) days after service of such respective notices.

In witness whereof, the University has executed these presents by its President of the Board of Curators of the University of Missouri, and the City has executed these same by its Director of Health and Director of Finance, by authority of its Council, the day and year first above written.

Board of Curators of the University of Missouri,

By .....
President

Kansas City, Missouri

By .....
Director of Health

By .....
Director of Finance.

Resources of a Metropolitan Area for Support of Medical Education

(Data on Kansas City and Jackson County)

A. *Teaching Hospitals.* The table below indicates the units of the established medical center offered by Kansas City to the University. In the aggregate, these units

represent an institution it would never be possible to establish in Columbia.

Hospitals	No. Beds	Cost of Duplication
General Hospital No. 1	550	$11,058,000
General Hospital No. 2	269	4,391,000
Leeds	240	5,416,000
Mental Health Center (to be built)	100	1,200,000
Mercy	145	1,668,000
Veterans	500	9,200,000
	1,804	$32,933,000

On the basis of 100 graduates per year, these facilities would provide 18 teaching beds per graduating student, a number that far exceeds the 10 recommended by the Council on Medical Education.

These facilities make it clear that it would be unnecessary for the University to construct a hospital of its own larger than the modest one of 250-bed capacity recommended by Dr. Diehl.

B. *Facilities for Establishing Intern and Resident Training in Other Hospitals.* The extent of these facilities in Kansas City is indicated in the table below.

Hospital	Beds	Patients Per Year	Bassinets	Infants Born
Menorah	280	6,156	26	720
St. Luke's	377	11,300	55	1,920
St. Mary's	290	7,661	40	1,209
Trinity	145	5,196	25	1,154
St. Vincent's	36	740	30	605
Research	211	7,817	40	1,415
Independence Sanitarium and Hospital	141	6,007	36	1,181
St. Joseph's	321	13,150	42	2,272

The above facilities would offer to a capable medical school administrator the most excellent opportunity to develop coordinated and well-rounded internships and residencies for graduates of the school under the direct control of our University.

Advantages of this kind could never be duplicated at any cost in Columbia.

C. *Existing Pool of Qualified Medical Men for Service in the School as Invaluable Clinical Teachers.* The table below contrasts the resources of Columbia and Jackson County in this regard.

Qualification	Jackson County	Columbia
General Practice	168	12
Internal Medicine	94	6
Dermatology	13	1
Neurology and Psychiatry	17	1
General Surgery	76	8
Orthopedic Surgery	23	1
Neurosurgery	5	None
Eye, Ear, Nose and Throat	41	4
Thoracic	2	None
Rectal	7	None
Urology	14	1
Plastic	3	None
Industrial	34	1
Gynecology and Obstetrics	43	1
Pediatrics	32	3
X-ray and Radium	17	2
Anesthesia	22	None
Pathology	14	4
Oral Surgery (Practice limited to)	6	None

A nucleus full-time faculty will be required no matter where the school is located, but the effectiveness of the teaching program and the cost of clinical instruction will depend to a large degree on the availability of a wide range of qualified clinicians in the teaching of medicine. There is no substitute for the experience of practicing physicians.

As Dr. Diehl has noted, the importance of a well-rounded and numerous part-time faculty goes beyond the undergraduate program of instruction. Such a faculty will be essential to the development of an effective continuation postgraduate teaching program for doctors throughout the entire State.

No expenditure of money in a small town location could duplicate such a faculty without which the school cannot hope effectively to discharge its obligation either in undergraduate teaching or in postgraduate service to the practicing doctors of the State.

D. *Professional Societies for the Advancement of Medical and Scientific Knowledge.* The list below indicates the wide range of such societies in the Kansas City area:

Kansas City Anatomical Society	34 members
Kansas City Pathological Society	15 members
Kansas City Dematological Society	16 members
Kansas City Anesthesiological Society	35 members
Kansas City Proctologic Society	7 members
Kansas City Urological Society	38 members
Kansas City Cardiac Club	50 members
Kansas City Obstetrical and Gynecology Society	77 members
Kansas City Society of O.O.R.L.	110 members
Kansas City Surgical Society	62 members

In addition to these, it is important to note that Kansas City is the home of the American Academy of General Practice. The influence of this society cannot but have some bearing on interesting students in entering this all-important field of medicine.

E. *Library Facilities.* The library of the Jackson County Medical Society is located in the General Hospital and would be available at no cost to the University. This library is one of the most extensive in the Middlewest and consists of 32,764 bound volumes and 250 current periodicals.

In addition to the medical society library, the public library of Kansas City, located within one block of the proposed school site, would provide a ready and conveniently available supplementary facilitiy for students.

REPORT NEOMYCIN EFFECTIVE IN TREATING BLOOD, URINARY INFECTIONS

Said to be highly effective in destroying a variety of disease organisms, neomycin—one of the newer antibiotics—has proved beneficial in many cases of blood and urinary tract infections where other antibiotics in current use have failed. This is reported by a group of Philadelphia medical researchers.

Drs. Garfield G. Duncan, John R. Wolgamot and Barkley Beidleman, and Carl F. Clancy, Ph.D., make public their findings in the January 13 *Journal of the American Medical Association.*

Ten patients suffering with bacterial infections of the blood or urinary organs were treated with the drug. Preliminary laboratory tests showed that the disease organisms were not affected by other methods of treatment, including antibiotics such as penicillin, streptomycin, aureomycin and chloramphenicol, but were sensitive to, or affected by, neomycin.

Results of neomycin treatment were "dramatically effective," the doctors report, in destroying organisms shown by test to be sensitive to it.

The doctors considered it "significant" that in no case in which the disease bacteria were eliminated did they return after treatment was stopped.

Reports of toxic effects were confined to one patient and it was necessary to discontinue treatment. She complained of hearing difficulties and the doctors found her kidney function was impaired. Her hearing improved on cessation of treatment; however, the kidney ailment persisted.

Research work at the hospital laboratory already has been successful in isolating 62 organisms of wide variety which are sensitive to neomycin but resistant, or only slightly sensitive, to other antibiotics.

PRESIDENT'S PAGE

Missouri State Medical Association, Annual Session, Kansas City, April 22, 23, 24, 25, 1951.

Why not mark these dates on your calendar now? And plan to be in Kansas City for the Annual Session.



Outstanding scientific papers will be presented for your benefit. Color television will be shown, bringing to you on the screen in the Auditorium surgical operations and medical clinics as they are being performed at the Kansas City General Hospital.

Your House of Delegates will meet and pass upon matters that are of importance to you. Old friends and classmates will gather to reminisce. May I suggest that you make your reservation early? A notice regarding hotels is in this issue of The Journal.

See you in Kansas City.



Editorials

ANNUAL SESSION

Features of the 93rd Annual Session to be held in Kansas City, April 22, 23, 24, 25, will be outstanding speakers on the scientific program, excellent presentations on color television, scientific exhibits and the hospitality of the Jackson County Medical Society which will be host for the session. Committees of the Society are working closely with officers of the Association and indications are that it will be an outstanding meeting.

The House of Delegates will convene on Sunday afternoon, April 22, at 2:00 p. m., and recess until Monday afternoon at 4:00 p. m. The final session of the House will convene on Wednesday afternoon, the last day of the session.

Scientific exhibits are being scheduled and members who wish to have exhibits who have not already reported them are asked to get in touch with Hjalmar E. Carlson, M.D., 1316 Professional Building, Kansas City, Chairman of the Committee on Scientific Exhibits, before March 15. The title of the exhibit and the space needed for the exhibit should be given, together with a description that the Committee may place the exhibits to the best advantage.

The Missouri Society of Medical Technologists will hold their fourth annual session in conjunction with the Association meeting. Scientific lectures will be presented and problem clinics will be held each day. Attendance at this meeting is open to any technologist or physician's assistant.

Committees for the Annual Session are:

General Committee on Arrangements: Victor B. Buhler, M.D., Kansas City, Chairman; Robert W. Kennedy, M.D., Marshall, and Donald M. Dowell, M.D., Chillicothe.

Executive Committee: Victor B. Buhler, M.D., Chairman; Morris B. Simpson, M.D.; Ira H. Lockwood, M.D.; Dillard M. Eubank, M.D., and Paul A. G. Johnson, M.D., Kansas City.

Arrangements Committee: Carl R. Ferris, M.D., Chairman; Max Goldman, M.D., and Frederick B. Campbell, M.D., Kansas City.

Scientific Exhibits: Hjalmar E. Carlson, M.D., Chairman; John W. Walker, M.D.; Ralph Emerson Duncan, M.D., and Ralph R. Coffey, M.D., Kansas City.

Entertainment: William R. Eubank, M.D., Chairman; Jack E. Schiffmacher, M.D.; Campbell C. McCullough, Jr., M.D., and Albert E. Upsher, M.D., Kansas City.

Publicity: Ira H. Lockwood, M.D., Chairman; Vincent T. Williams, M.D., and Paul N. Johnstone, M.D., Kansas City.

Past Presidents' Banquet: Morris B. Simpson, M.D., Chairman; James R. McVay, M.D.; A. W. McAlester, Jr., M.D., and G. Wilse Robinson, M.D., Kansas City.

Reception Committee: E. Kip Robinson, M.D., General Hospital No. 1; James E. McConchie, M.D., Independence Sanitarium; Joseph Getelson, M.D., Menorah Hospital; Everett A. Wilkinson, M.D., Research Hospital; Paul C. Quistgard, M. D., St. Joseph's Hospital; Lawrence P. Engel, M.D., St. Luke's Hospital; George F. Pendleton, M.D., St. Vincent's Hospital; James H. O'Neil, M.D., St. Mary's Hospital; Robert M. Myers, M.D., Trinity Lutheran Hospital.

A FOUR YEAR MEDICAL SCHOOL FOR THE UNIVERSITY OF MISSOURI

The State of Missouri owes it to its people to provide within the State University a first rate program of medical education as an essential initial step in the provision of adequate medical care for all Missourians.

The Missouri State Medical Association affirms this proposition; the Board of Curators of the University also affirms it; the press of the entire state supports it; most of our citizens agree with it.

Missouri needs a four year medical school as a part of its State University. This is the basic fact.

A further fundamental consideration, however, is that the new school should have every possible chance to succeed in the service of the people of the state when it is established. The Association is dedicated to making the school a success.

To establish a successful medical school is no small undertaking. There is no field of education more expensive. There is no field of education in which it is more difficult to do a first rate job.

In recent years, there has been so much misunderstanding of many of the basic elements involved in this problem that The Journal welcomes this opportunity to publish in full the texts of three recent reports relating to the establishment of the school. They are:

1. A Report to a Committee of the Board of Curators by Harold S. Diehl, M.D., Dean of the Medical Sciences, University of Minnesota.
2. Majority Report of the Special Committee of the Board of Curators.
3. Minority Report of Glenn W. Hendren, M.D., a member of the Special Committee of the Board of Curators.

It is believed that these reports will give, not only to the medical profession but to every interested citizen, all the information needed for an informed judgment on where the school should be located best to serve the people of Missouri and best to succeed as an institution of medical education.

It is believed that a thorough reading of this recent review of the problem can result in no other conclusion than that the school must be located in a metropolitan area to do the job which Missouri has the right to expect of it.

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Organization and Economics

NEWS NOTES

The Mid-Continent Psychiatric Association will meet at Hotel President, Kansas City, on March 31 and April 1. Among speakers at the session will be Charles F. Von Salzen, M.D., Hartford, Conn.; Martin H. Hoffman, M.D., Detroit, and Guy F. Witt, M.D., Dallas. Members interested in attending should contact Paul Hines, M.D., 2625 West Paseo, Kansas City.

Grayson Carroll, M.D., St. Louis, has been appointed a member of the council of the Southern Medical Association from Missouri to begin a five year term at the annual session to be held in Dallas, Texas, in November. He will succeed Daniel L. Sexton, M.D., St. Louis.

Herbert L. Mantz, M.D., Kansas City, has been appointed chief consultant in tuberculosis for the United States Veterans Administration.

William A. Fries, M.D., St. Louis, was the guest of members of his family at the Missouri Athletic Club in celebration of his 90th birthday on January 14. Armand D. Fries, M.D., St. Louis, his son, was among those attending.

William B. Cheeseman, M.D., Kansas City, was the speaker at the monthly staff meeting of the Fairfax Community Hospital, Fairfax, on January 22.

H. E. Erni, M.D., Macon, spoke on "Medical Needs of the United States Today and in the Future" at a meeting of the Macon Rotary Club on January 24.

Richard L. Sutton, Sr., M.D., McAllen, Texas, honor member of the Jackson County Medical Society, has been elected a corresponding member of the Swedish Dermatological Society.

MUSINGS OF THE FIELD SECRETARY

The Armed Forces are calling for more and more doctors and nurses, new Veterans Administration hospitals are seeking professional staffs, plans are continuing for additional hospitals under the Hill-Burton Federal Aid Hospital Construction program, civil defense planning encompasses large medical responsibilities, various government agencies are continuing their competition for physicians and ordinary every day sick folks still need doctors. This situation has a tendency to place in the limelight, with considerable forcefulness, the somewhat forgotten law of supply and demand. Such a condition offers great opportunity for the stimulation of emotionalism which could produce detrimental effects on medical education in the future.

It is reasonable to assume that the secretary of a county medical society may or may not be a motivating force in the activities of his society. By virtue of his position as secretary he receives most of the correspondence and information concerning the society as a whole. His records of members and nonmembers make him a source of information. Through him are funneled facts, figures, suggestions, requests and ideas from outside sources. In many cases he is expected to, and does, keep the committees and officers of the society on their toes. It is interesting to note that many county societies elect a new secretary each year while others keep the same doctor in that important position year after year.

MISSOURI CHAPTER, AMERICAN COLLEGE OF CHEST PHYSICIANS

The Missouri Chapter of the American College of Chest Physicians will meet at the President Hotel, Kansas City, on April 22, at 1:00 p. m. The members of the College will meet at 12:30 p.m. and a luncheon meeting will be held at 1:00 p.m. The following program will be presented:

The Sinuses and Bronchiectasis, G. O. Proud, M.D., Kansas City, Kansas.

The Therapeutic Potentialities of Artificial Pneumoperitoneum, Andrew L. Banyai, M.D., Detroit, Mich.

The Diagnosis and Management of Circumscribed Lesions of the Lungs, Corrin H. Hodgson, M.D., Rochester, Minn.

X-Ray Conference: Lawrence E. Wood, M.D., Kansas City, Moderator.

HODGEN CLUB

The Hodgen Club, organized to further the interests in the St. Louis City Hospital and the teaching and practice of surgery as promulgated by one of the hospital's most illustrious alumni and one of its first two interns, the late John Thompson Hodgen, M.D., was formed during the January session of the sectional meeting of the American College of Surgeons. Membership will be limited to certified surgeons who are members of the St. Louis City Hospital Alumni and will be restricted to twenty-five. The first scientific meeting will be held in April at the Childrens Hospital, Chicago, and will consist of a two day clinic and operative demonstration by Willis J. Potts, M.D., Chicago.

Officers of the newly formed Hodgen Club are: President, Avery P. Rowlette, M.D., Moberly; vice president, Cyril Costello, M.D., St. Louis; secretary-treasurer, Leo V. Mulligan, M.D., St. Louis.

MISSOURI STATE MEDICAL ASSOCIATION

The 93rd Annual Session of the Missouri State Medical Association will be held at the Municipal Auditorium, Kansas City, April 22, 23, 24 and 25, 1951.

SCIENTIFIC PROGRAM OF GENERAL MEETINGS

Monday, April 23, 1951, 8:15 a. m., Little Theater, Municipal Auditorium

8:15 a. m. Color Television: Surgical.
Cholecystectomy, V. T. Williams, M.D., Kansas City, and Residents of Kansas City General Hospital.
Herniorrhaphy, Ralph R. Coffey, M.D., Kansas City, and Residents of Kansas City General Hospital.
Pilonidal Cyst, Mark M. Marks, M.D., Kansas City, and Residents of Kansas City General Hospital.

Intermission to View Exhibits—10:15 to 10:45 a. m.

10:45 a. m. Arthritis, Comments on Diagnostic Problems and New Developments in Therapy, Edward F. Rosenberg, M.D., Chicago.
11:15 a. m. Rh and Hr Sensitization in Obstetric Practice, W. D. Beacham, M.D., New Orleans.
11:45 a. m. Temperatures During Anesthesia and the Use of Ether Bed in Pediatric Care, John A. Bigler, M.D., Chicago.
1:30 p. m. Color Television: Medical.
Fracture Clinic, Rex L. Diveley, M.D., and Richard H. Kiene, M.D., Kansas City.
Arthritis Clinic, C. S. Gillmor, M.D.; James A. Jarvis, M.D., and P. L. Byers, M.D., Kansas City.
Peripheral Vascular Clinic, F. Stanley Morest, M.D., Kansas City, and Residents of Kansas City General Hospital.

Intermission to View Exhibits—3:00 to 3:30 p. m.

3:30 p. m. Cardiac Surgery From the Standpoint of the General Practitioner, C. Rollins Hanlon, M.D., St. Louis.
4:00 p. m. Rheumatoid Arthritis, Present Status of Hormone Therapy, Edward F. Rosenberg, M.D., Chicago.
4:30 p. m. Ectopic Pregnancy, W. D. Beacham, M.D., New Orleans.

Tuesday, April 24, 1951, 8:15 a. m., Little Theater, Municipal Auditorium

8:15 a. m. Color Television: Surgical.
Perineorrhaphy, Kenneth Cox, M.D., Kansas City, and Residents of Kansas City General Hospital.
Total Hysterectomy, Harold L. Gainey, M.D., and James E. Keeler, M.D., Kansas City.

Intermission to View Exhibits—10:15 to 10:45 a. m.

10:45 a. m. The Use of Diuretics in Congestive Heart Failure, G. E. Burch, M.D., New Orleans.
11:15 a. m. The Caprices of Sarcoidosis, Andrew L. Banyai, M.D., Milwaukee.
11:45 a. m. Anomalies of the Gastrointestinal Tract in the Newborn Amenable to Surgery, John A. Bigler, M.D., Chicago.
1:30 p. m. Color Television: Medical.
Cardiac Clinic, A. Graham Asher, M.D., and Joseph E. Welker, M.D., Kansas City.
Tumor Clinic, E. Kip Robinson, M.D.; Victor B. Buhler, M.D.; F. J. McCoy, M.D., and Edward H. Klein, M.D., Kansas City.
Dermatology, Robert J. Murphy, M.D., Kansas City.

Intermission to View Exhibits—3:00 to 3:30 p. m.

3:30 p. m. Symposium on Hematology.
Classification of Anemias, Roland P. Ladenson, M.D., Columbia.
Classification of Leukemias, Jack H. Hill, M.D., Kansas City.
Recent Trends in Treatment, Edward H. Reinhard, M.D., St. Louis.

Wednesday, April 25, 1951, 8:15 a. m., Little Theater, Municipal Auditorium

8:15 a. m. Color Television: Surgical.
Biopsy of Breast, Carl B. Schutz, M.D., and Walton C. Ingham, M.D., Kansas City.
Thyroidectomy, Claude J. Hunt, M.D., and Walter Cummins, M.D., Kansas City.



STERILE HIGH TITER

GROUP SERA

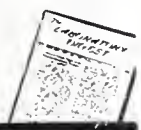
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Our sera are manufactured under Government License No. 160, N.I.H. These sera are Anti-A, Anti-B, and Absorbed Anti-A. Absorbed Anti-A serum is to differentiate between A_1 and A_2 bloods. Anti-M and Anti-N sera are used for blood spots and paternity work. Our Anti-Rh serum is manufactured by a reliable organization and must be used with a viewing box.

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Relationship of Stress to Autonomic Lability

Studies in psychosomatics have shown that functional disorders often are a result of the patient's inability to adjust to emotionally stressful situations (stressor factors).

Nervous tension and chronic anxiety, discharged through a labile Autonomic Nervous System, can cause somatic disturbance. [1,2] Such states may involve any one of the organ systems or several at one time. [1,3] The outline below is designed to relate gastrointestinal and cardiovascular symptomatology to the exaggerated response of the autonomic nervous system.

	Physiologic Effects of Autonomic Discharge	
	Sympathetic	Parasympathetic
Gastro-intestinal System	Hypomotility Intestinal Atony Hyposecretion Reduced salivation	Hypermotility Gastrointestinal spasm Hypersecretion
Cardio-vascular System	Rapid heart rate Peripheral vaso-constriction	Slow heart rate Vasodilatation
Functional Manifesta-tions	Palpitation Tachycardia Elevated blood pressure Dry mouth and throat	Heartburn Nausea-vomiting Low blood pressure Colonic spasm

The data here tabulated is from references [3,4,5,6,7] given below.

When the clinical picture is suggestive of functional disorder, the diagnosis is supported by the presence of the following indications of autonomic lability:

Variable Blood Pressure
Body Temperature Variations
Changing pulse rate
Deviations in B. M. R.
Exaggerated Cold Pressure Reflex
Oculo-Cardiac Reflex Abnormalities
Glucose Tolerance Alterations

Therapy in these cases is directed toward: 1) relieving the somatic disturbance to prepare the patient for psychotherapy*; 2) guidance in making adjustment to stressful situations and correction of unhealthy attitudes.

*Drug treatment using adrenergic and cholinergic blocking agents in conjunction with sedatives. [8,9,10]

1. Ebaugh, F.: Postgrad. Med. *4:* 208, 1948. 2. Wilbur, D.: J.A.M.A. *141:* 1199, 1949. 3. Williams, E. and Carmichael, C.: J. Nat'l. Med. Assoc. *42:* 32, 1950. 4. Goodman, L. and Gilman, A.: The Pharmacological Basis of Therapeutics, The Macmillan Co., 1941. 5. Katz, L. et al: Ann. Int. Med. *27:* 261, 1947. 6. Weiss, E. et al: Am. J. Psychiat. *107:* 264, 1950. 7. Alvarez, W.: Chicago Med. Soc. Bulletin, 581, 1950. 8. Rakoff, A.: A Course in Practical Therapeutics, Williams and Wilkins, 1948. 9. Karnosh, L. and Zucker, E.: A Handbook of Psychiatry. C. V. Mosby Co., 1945. 10. Harris, L.: Canad. M.A.J. *58:* 251, 1948.

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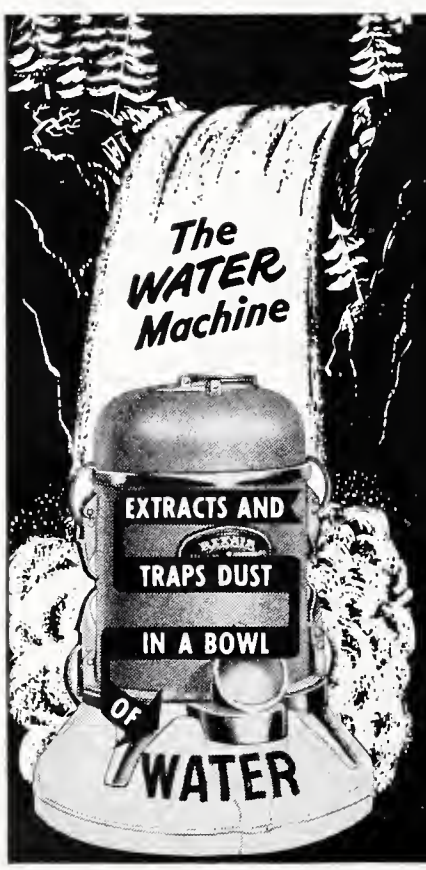
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10:45 a. m. Modern Treatment of Cough, Andrew L. Banyai, M.D., Milwaukee.

11:15 a. m. Clinical Applications of Venous Pressure Measurements, G. E. Burch, M.D., New Orleans.

11:45 a. m. Modern Concepts in the Diagnosis and Management of Minimal Chest Disease, Paul W. Schafer, M.D., Kansas City, Kansas.

1:30 p. m. Color Television: Medical.

Pediatric Clinic, Edwin H. Schorer, M.D.; Frank Hogue, M.D., and Harry Gilkey, M.D., Kansas City.

Technic of the Neurologic Examination, F. A. Carmichael, M.D., and Robert W. Forsythe, M.D., Kansas City.

Disorders of the Back, F. Garrett Pipkin, M.D., Kansas City, and Residents of Kansas City General Hospital.

Disorders of the Feet, N. S. Pickard, M.D., Kansas City and Residents of the Kansas City General Hospital.

DEATHS

Klinkerfuss, George H., M.D., Normandy, a graduate of Washington University School of Medicine, 1923; Fellow of the American Medical Association; member of the St. Louis County Medical Society; aged 58; died December 10.

Dunkeson, Edward B., M.D., Lathrop, a graduate of the Kansas City Medical College, 1893; member of the Clinton County Medical Society; aged 82; died December 12.

Titsworth, Guy, M.D., Sedalia, a graduate of St. Louis University School of Medicine; honor member of the Pettis County Medical Society; aged 73; died December 13.

Crawford, Harry S., M.D., Long Beach, California, a graduate of the Kansas City Medical College, 1902; Affiliate Fellow of the American Medical Association; honor member of the Cass County Medical Society; aged 86; died December 19.

Ellis, Frank B., M.D., Garden City, a graduate of the University Medical College of Kansas City, 1897; Fellow of the American Medical Association; member of the Cass County Medical Society; aged 78; died December 28.

Smith, James M., M.D., St. Louis, a graduate of St. Louis University School of Medicine, 1912; honor member of the St. Louis Medical Society; aged 69; died January 2.

Barron, W. Harry, M.D., Fredericktown, a graduate of Barnes Medical College, 1904; Fellow of the American Medical Association; member of the Mineral Area County Medical Society; aged 76; died January 3.

Shores, Earl M., M.D., St. Joseph, a graduate of St. Louis University School of Medicine, 1916; Fellow of the American Medical Association; honor member of the Buchanan County Medical Society; retired; aged 60; died January 4.

Gay, Ray J., M.D., Kansas City, a graduate of the National University of Arts and Sciences, 1914; Fellow of the American Medical Association; member of the Jackson County Medical Society; aged 60; died January 7.

Heaton, Asa H., M.D., Sedalia, a graduate of the Indiana Eclectic Medical College, Indianapolis, 1881; honor member of the Pettis County Medical Society; retired; aged 90; died January 9.

Etzenhouser, Russell D., M.D., Independence, a graduate of the University of Kansas School of Medicine, 1931; Fellow of the American Medical Association; member of the Jackson County Medical Society; aged 51; died January 16.

Nickell, Luther O., M.D., Moberly, a graduate of St. Louis University School of Medicine; honor member of the Chariton-Macon-Monroe-Randolph County Medical Society; aged 74; died January 19.

Schofield, Linn J., M.D., Warrensburg, a graduate of the University of Louisville School of Medicine, 1887; Fellow of the American Medical Association; honor member of the Johnson County Medical Society; aged 90; died January 23.

Cantrell, Cyrus D., M.D., Kansas City, a graduate of the University of Texas School of Medicine, 1902;

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Hamblen, E. C.: North Carolina M. J. 7:533 (Oct.) 1946.

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*Perloff, W. H.: Am. J. Obst. & Gynec. 58:684 (Oct.) 1949.

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Asel, Norman D., M.D., Columbia.
Benson, Scott C., M.D., St. Joseph.
Berg, Ralph, Jr., M.D., St. Louis.
Biggins, Cloice H., M.D., Lathrop.
Blache, J. Owen, M.D., St. Louis.
Block,Arnold S., M.D., St. Louis.
Brown, Thomas K., M.D., St. Louis.
Carpenter, George T., M.D., St. Joseph.
Cassel, Melvin A., M.D., St. Louis.
Cohnberg, Rosellen E., M.D., Monett.
Didge, Mark, M.D., Kansas City.
Duggan, John J., Jr., M.D., St. Louis.
Durm, Thomas I., M.D., Cassville.
Esch, John G., M.D., Republic.
Fee, Wesley S., M.D., St. Louis.
Fischer, Harry W., M.D., St. Louis.
Hawkins, George L., Jr., M.D., St. Louis.
Kalin, John A., M.D., St. Joseph.
Keller, Hiklaus J. A., Jr., M.D., St. Louis.
Knowlton, Norman P., Jr., M.D., St. Louis.
Lapi, Ruth M., M.D., Kansas City.
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Lipsitz, Ellis S., M.D., St. Louis.
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Ragsdale, William E., Jr., M.D., St. Louis.
Ramsey, Ora Wayne, M.D., Marionville.
Scheer, George E., M.D., St. Louis.
Schertz, Truman B., M.D., St. Joseph.
Stacey, Wallace R., M.D., St. Louis.
Tanaka, George M., M.D., St. Louis.
Wallace, Edgar S., M.D., St. Louis.
Walton, Clifford L., Jr., M.D., St. Louis.
Washington, Edward Lee, M.D., Columbia.
Weinhaus, Robert S., M.D., St. Louis.
Wood, William W., M.D., Springfield.
Wu, William Q., M.D., Kansas City.

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Mineral Area County Medical Society

The regular monthly meeting of the Mineral Area County Medical Society was held at State Hospital No. 4, Farmington, at 8:00 p.m., January 25.

Paul Murphy, M.D., and Joseph Lucido, M.D., St. Louis, gave a timely and valuable discussion of the problems uncovered by mass x-ray surveys. Also, the diagnosis of cancer of the lung was discussed.

Members present were Drs. C. H. Appleberry, Paul Jones, J. L. Foster, Marvin Haw, H. M. Roebber, Van Taylor, Marvin Grossman, S. C. Slaughter, F. R. Crouch and James Stout.

The Woman's Auxiliary also met. Mrs. C. H. Appleberry gave a book review of "The Doctors Mayo."

JAMES J. STOUT, M.D., Secretary.

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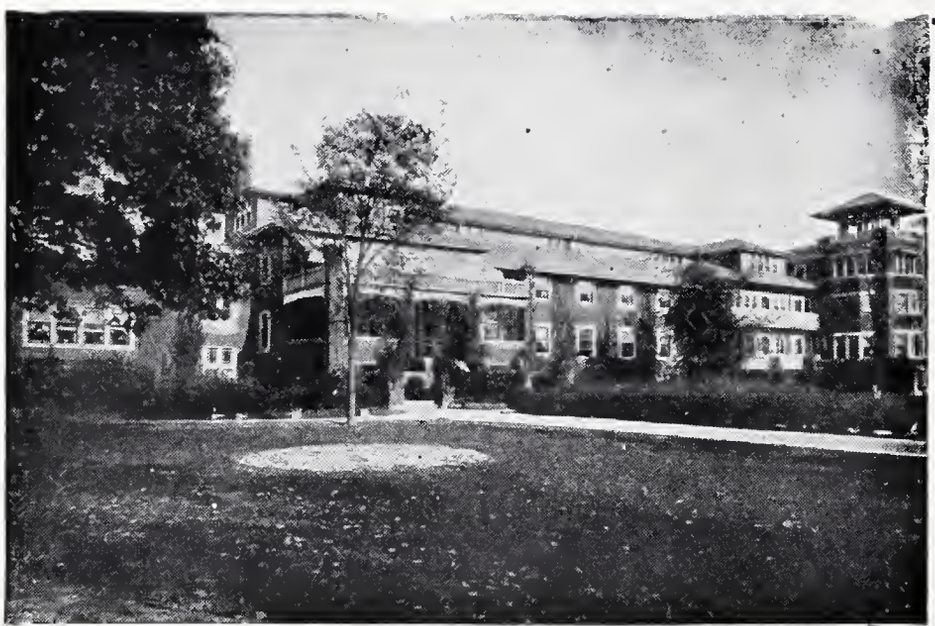
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*Hill, L. W.: New England J. Med. 242:288, 1950

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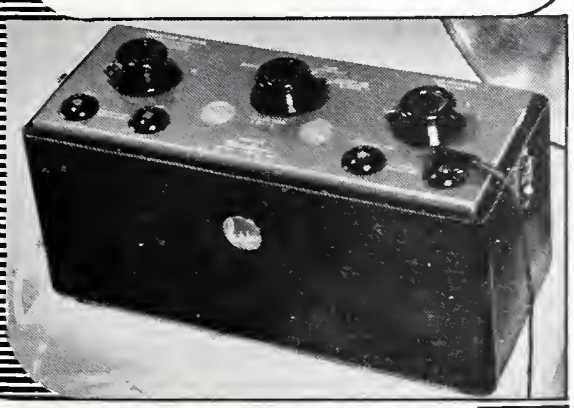
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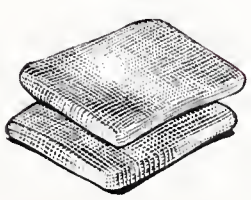
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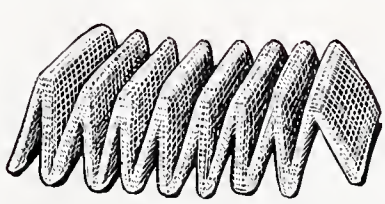
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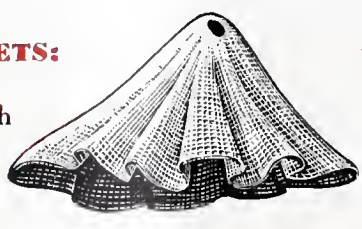
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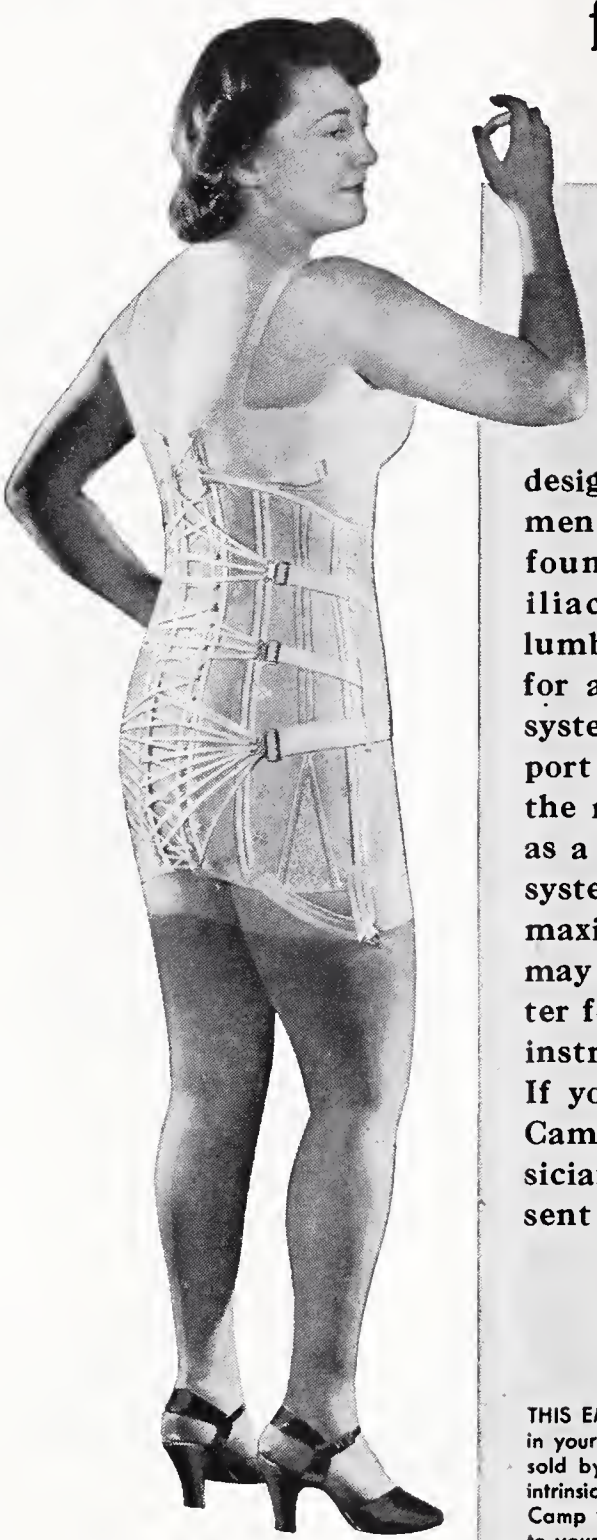


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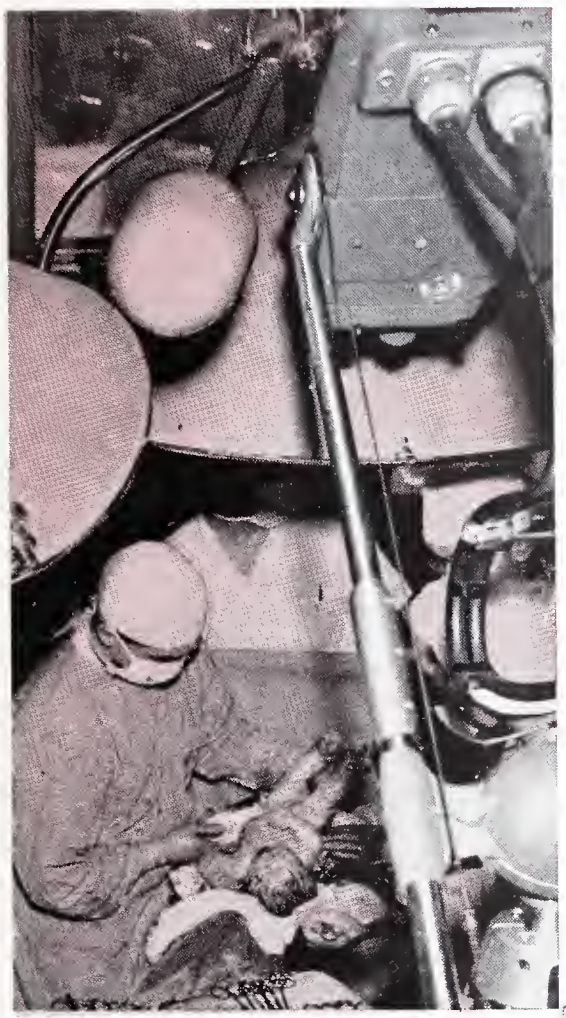
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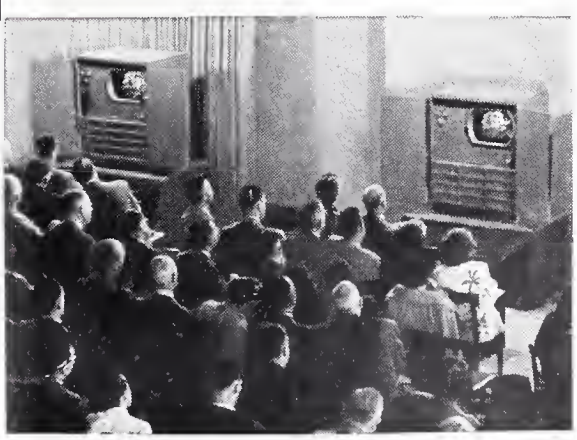
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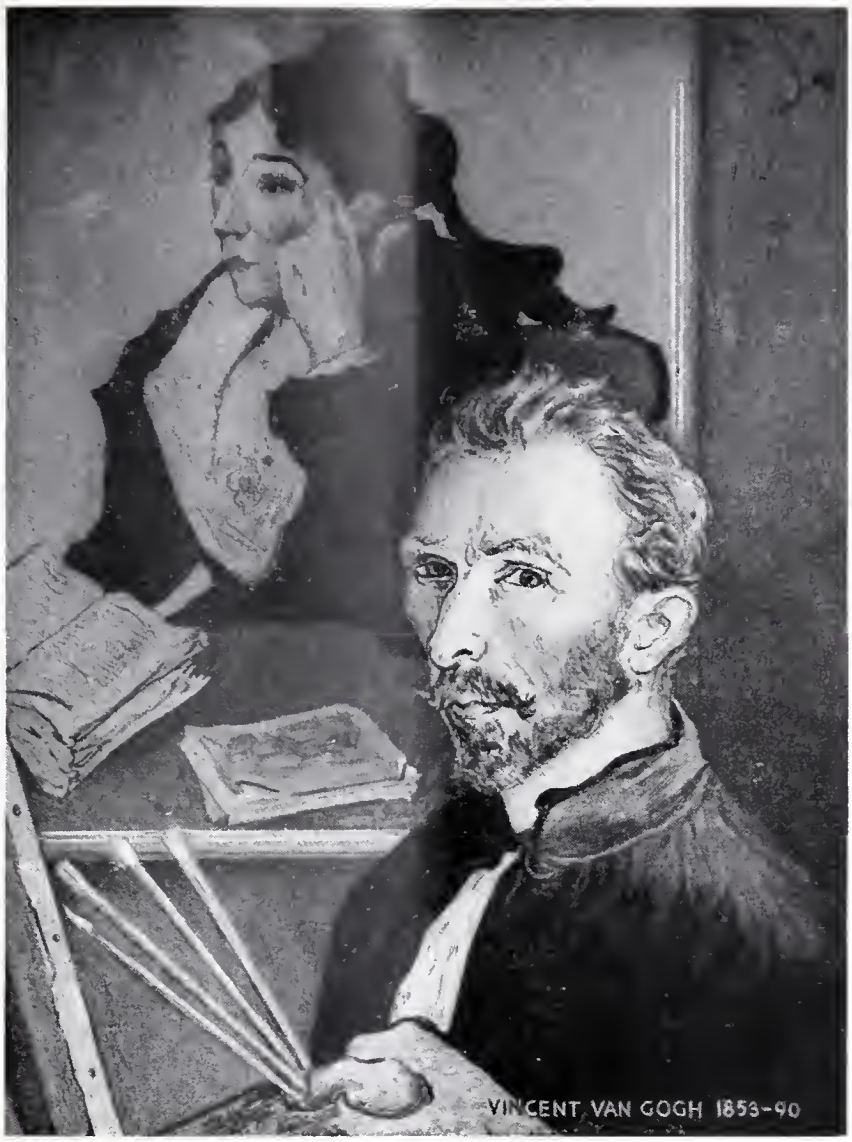
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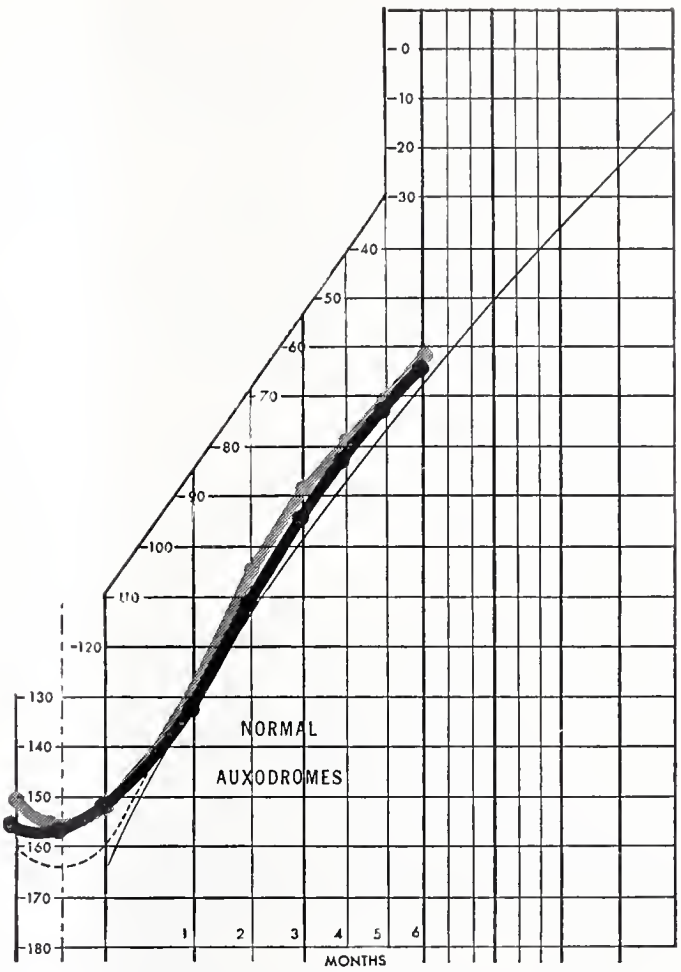
Normal schedule of development (auxodrome) plotted on Wetzel Grid.[1]

CURVE A

Composite Wetzel Grid auxodrome of 60 unselected infants on S-M-A from birth to 6 months of age.

CURVE B

Growth data, recomputed on Wetzel Grid, based on "selected subjects, most of whom were favored by environment;"[2] age: from birth to 6 months.



1. Wetzel, N. C.: J. Pediat. *29*:439, 1946.
2. Jackson, R. L., and Kelly, H. G.: J. Pediat. *27*:215, 1945.

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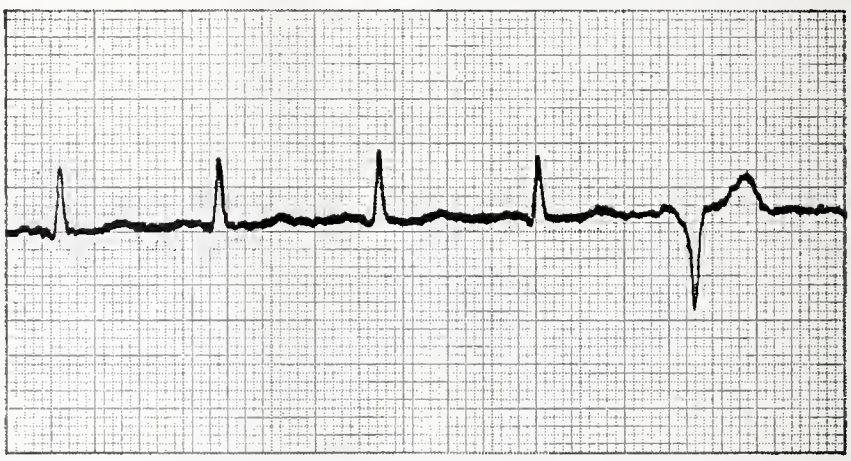
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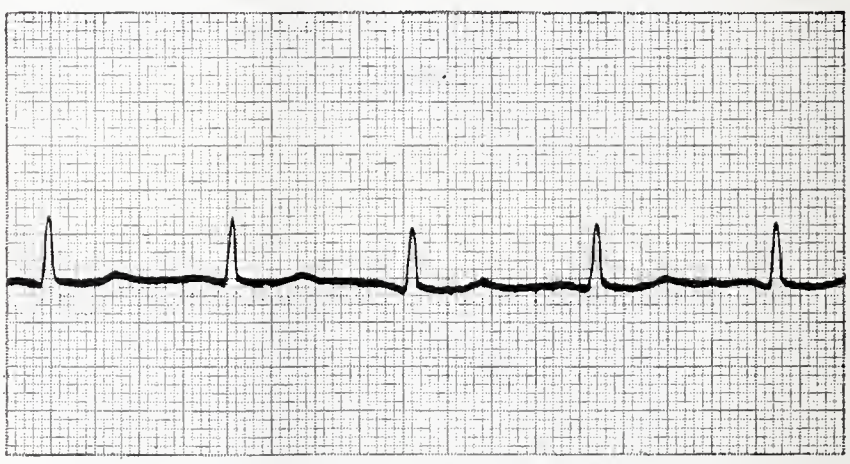
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Scientific Articles

TREATMENT OF FRACTURES OF THE FEMORAL SHAFT WITH THE MEDULLARY NAIL

FRED C. REYNOLDS, M.D.
ST. LOUIS

THE OBJECT in the management of any fracture is to secure union of the fracture in good position at the earliest possible time with a minimum of permanent impairment. In applying this objective to fractures of the femoral shaft, total cost to the patient must receive serious consideration not only as to length of hospital stay but, also, as to the period of rehabilitation during which the patient is unable to work. Any method of treatment that requires prolonged hospitalization or prolonged physiotherapy after the fracture is solid must give excellent end results to be justified. On the other hand, methods that are devised to shorten hospitalization and reduce impairment must not be attended with great danger either as regards failure of union or more serious risk to the extremity or life of the patient. As one attempts to shorten the hospital stay and also the period of total disability, as well as to decrease the impairment, methods of fixation of the fracture must be used to allow early active function. These methods of fixation have of necessity greater chances of complications. Management of each case of femoral shaft fracture must be handled as an individual problem and the method of treatment used must be that which in the surgeon's opinion is the best suited for that particular patient.

SIMPLE FRACTURES

Transverse fracture of the femur often lends itself to manipulative reduction by using the fracture table for traction while gentle manipulation is carried out. Fixation is secured by a spica cast after reduction is obtained. This allows early discharge from the hospital, freeing a hospital bed and saving money for the patient. It is also conducive to early union of the fracture. However, except in children and adolescents, there is always a considerable period of rehabilitation following removal of the cast and almost always impairment of knee function. Simple reduction and cast will not maintain length and alignment in any but the transverse fracture. Comminuted and oblique fractures must be treated by traction or open reduction and internal fixation.

Skin traction is rarely satisfactory except in infants and even here perfect reduction is seldom obtained; however, it is not necessary. The amount of force must be small and constant supervision is necessary to avoid soft tissue damage (figs. 1 and 2). Skeletal traction is preferable in all but infants. The method is applicable to any femoral shaft fracture and is particularly useful with poor risk patients and combined multiple injuries. The traction wire or pin may be inserted under local anesthesia with the patient in bed with a Thomas splint supporting the extremity. However, the pin should always be placed under clean operating room conditions. The tibial tubercle is the site of election. There is less danger of damage to the knee and, should open reduction become advisable, the pin tract is well out of the operative field. There is no danger of damage to the knee by trac-



Fig. 1. Bryant's traction for treatment of shaft fractures in infants.

From the Department of Surgery, Washington University School of Medicine, St. Louis, Missouri.

tion so long as the fracture is not united (fig. 3).

If traction fails to result in satisfactory position, open reduction is easily carried out with the patient in bed in traction under local anesthesia and, if necessary, the traction splint continued as external immobilization as well as a means of early active and passive motion to the knee by means of the Pearson attachment (fig. 4).

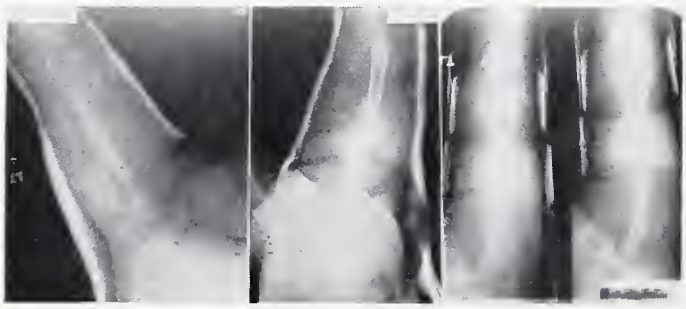


Fig. 2. A. X-ray of fracture in traction. B and C. Anterior-posterior and lateral views after application of spica cast four weeks after fracture. The fracture is now stable enough to allow cast and discharge from hospital.

Skeletal traction properly used is a most satisfactory method of managing shaft fractures. It fails to measure up to all objectives for treatment of fractures; that is, it requires prolonged hospitalization at considerable expense in spite of the fact that as soon as the fracture is stuck a spica cast can be applied, thus shortening the hospital stay. This method always results in some impairment of the knee function except in the young patient, and even here requires considerable rehabilitation. Furthermore, unless properly used it will lead to distraction of the fragments and nonunion.



Fig. 3. Skeletal traction for femoral shaft fracture in adults. The half ring splint is reversed for more comfort. This must be supported carefully to prevent pressure on top of the leg.

Open reduction with internal fixation, by means of wire suture, screws or plates, requires some form of external fixation as well and, although it affords early discharge from the hospital, will result in long disability and permanent impairment of knee function. When one adds the risk of open operation and the definite increase in chances of nonunion it would seem that open reduction with internal fixation by means of suture, screw and a single plate should only be used in carefully selected cases. Often it is the only satisfactory method in lower one third fractures and supracondylar fractures.

The two plate method of Clay Murray and the dual plate of Key both supply adequate internal fixation (no external fixation is required) and allow early mobilization of joints. Either of these approaches the objective for treatment; however, the two plate fixation is not strong enough to allow early weight bearing in most cases and the dual plate fixation is rather difficult to apply.

In an effort to avoid some of the problems of open reduction and internal fixation, the multiple pin

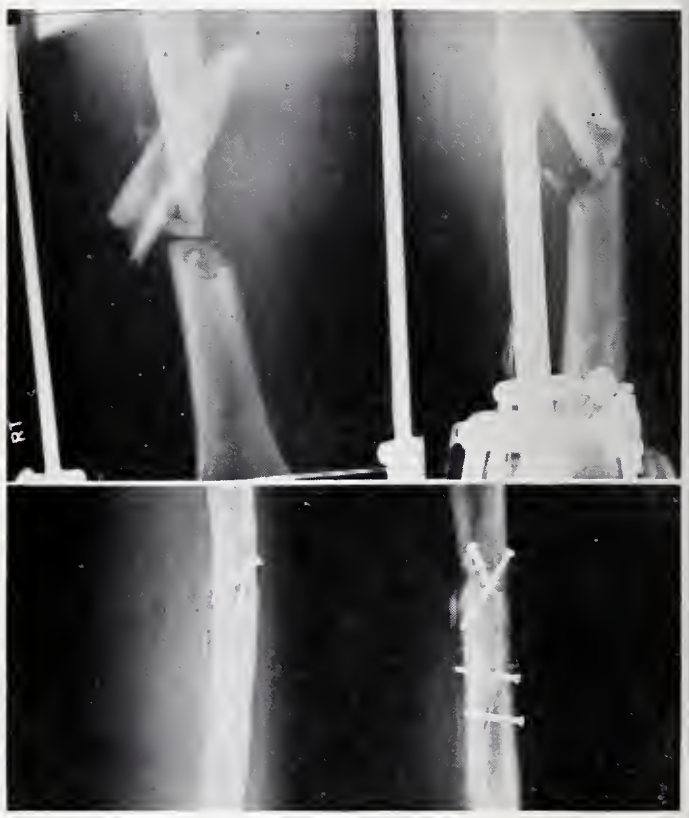


Fig. 4. A. Fracture of femoral shaft in skeletal traction. This patient had multiple injuries which included severe head injury, fracture of mandible, simple fracture of left humerus, simple fractures of both femurs and comminuted fractures of both ankles. After his condition became stabilized, open reduction under local anesthesia while in traction splints was carried out on both femurs. This is a view of the right femur. B. Anterior-posterior and lateral view of right femur following open reduction and internal fixation with four screws.

and external bar fixation methods have come into use. Satisfactory employment of this method has the same prerequisite as open reduction and internal fixation. These are: (1) a well trained fracture surgeon and (2) extensive experience with this particular method for the dangers are many, i.e. (a) distraction of the fracture with nonunion, (b) infection of the fracture as a result of the pin going into the fracture site of the hematoma, (c) ring sequestra and infection, (d) infection of joints and (e) nerve and blood vessel injuries.

The only method of treatment of a shaft fracture that tends to meet all the requirements is intramedullary fixation with a Kutschner nail, or modification of the nail. This is not applicable to subtrochanteric or to low shaft or supracondylar frac-

tures. A proper size nail may be inserted quickly and easily by the open method, the operative procedure being comparable to an open reduction and plating. Selection of the nail must be done carefully by preoperative measurements of the diameter of the medullary canal and the length of the good leg. Length measurements may be obtained in several ways. One method is to strap a nail of known length to the midline of the lateral surface of the good thigh and take an x-ray. A more accurate method is to center one tube over the knee and one over the hip. Markers a known distance apart are then placed over the cassette, one at the level of the top of the trochanter and the other at the level of the condyle of the femur. With this double film an accurate measurement of the distance between the markers can be determined.

A simple method that is fairly reliable is to measure from the trochanter to the lateral condyle of the femur and subtract one inch.

After the nail has been selected (to be on the safe side I have nails of appropriate length a size smaller and a size larger on hand) the patient is



Fig. 5. Fresh fracture of femoral shaft treated by open reduction and intramedullary nailing.

placed on the table lying with the injured side up and the fracture site is explored through a posterolateral incision. The proximal fragment is grasped with a bone holding forceps and the guide wire inserted along the medullary canal and driven out through the upper end. This usually emerges just medial to the greater trochanter. When the point presents itself beneath the skin a small incision is made to deliver the point of the guide. The nail that has been selected is then placed over the guide wire and driven down through the shaft to the fracture site. The guide wire is then removed, the fracture reduced and while reduction is maintained the nail is driven down the medullary canal of the distal fragment, special care being taken to maintain alignment and rotation. Then the distal fragment is impacted by striking the knee or foot. From one to one and one half inch of the nail should protrude above the proximal shaft for ease of removal of the nail later. It is important that a complete set of instruments including hack saw and extractor be on hand so that something may be done should the nail become stuck.

Most of the cases have some hematoma postoperatively and it is better to drain for twenty-four hours. Many have considerable effusion of the knee for the first few days postoperatively. I do not know why this should be. As soon as the wound is healed the patient is allowed up with active use of the leg and partial weight bearing with crutches. The total period of hospitalization is usually two weeks or less.

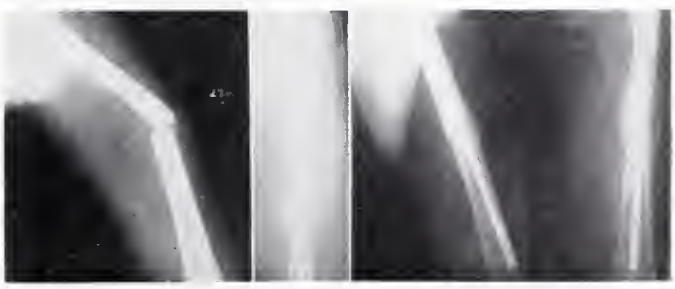


Fig. 6. A. Delayed union of three and one half months duration with anterolateral bowing. B. After open operation with intramedullary nailing and iliac graft. C. Progress of union five months postoperatively. Nail was removed at this time because of irritation of the soft tissue by the long proximal end of the nail.

Figure 5 shows x-ray of a 16 year old boy who left the hospital nine days after his fracture with partial weight bearing on crutches. Six weeks from the date of the fracture he returned to work on the farm driving a tractor. Eight weeks from the time of the fracture he had solid union and no difference in length or ability to use the two legs.

This is, of course, unusually rapid but it illustrates the superiority of the intramedullary nail over all other methods for treatment of this frac-



Fig. 7. Postoperative x-ray following intramedullary nailing to correct a malunited fracture of long standing. The proximal end of the nail extends too far above the trochanter.

ture. So far I have not had a case of nonunion of a fresh fracture so treated, nor does union seem unusually delayed. The operation is no more difficult or hazardous than any other open treatment of fractures of the femoral shaft. Shock should be anticipated and prevented by giving blood during the operation.

The management of either nonunion or malunion of fractures of the femoral shaft is equally well adapted to use of the intramedullary nail.

With nonunion there is always atrophy of the leg and stiffness of the knee and other joints if prolonged immobilization has been used. By no other method can active use of these joints be begun immediately after bone graft.

Figure 6 illustrates a case treated in a hip spica cast for three and one half months. Nonunion and stiffness of the knee both responded rapidly to nailing and iliac graft. In this case too much nail was left out of the proximal end which by motion produced a bursa and caused pain. The nail, therefore, was removed as soon as union occurred.

Figure 7 is an example of fixation following osteotomy for malunion of long standing.

COMPOUND FRACTURES

Compound fractures differ from simple fractures only in that there is a wound connecting the fracture to the outside. This produces the hazard of infection. The object of treatment, therefore, is to convert the compound fracture to a simple fracture at the earliest possible time by obtaining a clean and healed wound. Use of foreign material (screws, plates) at the time of debridement increases the chances of infection, therefore, should be limited as much as possible. In those cases in which the patient can be readied for surgical procedures within six to eight hours after injury and in which the wound is not extensive or badly soiled so that after a thorough debridement the wound may be closed without tension, it is permissible to fix the fracture with one or two screws or wire sutures. Extensive dirty wounds or those that are not seen immediately, as well as all wounds that cannot be closed readily without tension, should be packed open and immobilized by cast or by traction as the fracture demands. In any case of doubt the safe procedure is to leave the wound open following debridement. Closure by delayed primary suture or secondary closure of the wound at the end of from seven to ten days will then be possible if the wound is clean. Extensive loss of soft tissue will necessitate closure by shifting skin flaps or split skin grafts. Internal fixation should never be used in a wound that requires packing and secondary closure. I have not used an intramedullary nail in a compound fracture so far, but, I feel that it could be used in any case in which the wound appears satisfactory after careful debridement with adequate soft tissue for closure.

With a well healed wound the compound fracture may be managed the same as simple fractures of the same type.

SUMMARY

Femoral shaft fractures are all individual problems. The type of treatment to be selected is the one that seems to fit that particular patient and also one which is apt to do best in the hands of that particular surgeon. Except in the young patient all forms of conservative treatment result in prolonged disability and almost all have impairment of knee function. Many of the procedures designed to reduce the disability and impairment are contraindicated because of excess hazard of their use.

At present it appears that the treatment of choice for shaft fracture above the supracondylar area and below the subtrochanteric area is intramedullary fixation. This method alone satisfies all of the objectives for treatment of fractures of the femoral shaft. When performed by the open method the hazards of the operation are no greater than other open reductions. This method may soon be held in the same light as insertion of a Smith-Petersen nail for fractures of the femoral neck.

4952 Maryland Ave.

DOCTOR AND INCOME TAX

With the income tax deadline just passed, an economist says that the average physician gets a "raw deal" on his income tax rate. In the words of Frank G. Dickinson, director of the Bureau of Medical Economic Research of the American Medical Association, here is why:

"Most of us employed by companies are covered by pension or profit-sharing plans chalked up to 'operating expenses.' We are not taxed for these extra earnings until we receive them. By then, most of us are retired and our tax burdens are reduced because we are in the lower income tax brackets. Among physicians and other professional workers, only those employed by companies are eligible for such pensions. Most professional persons are self-employed; they cannot charge off a pension to business expenses.

"The physician has the longest training period among professional people, starting to earn around age 28. During his nine or more years of training, his lost income and expenses amount to about $35,000. Accordingly, he must earn $5,000 extra each year in order to catch up to the person who went to work at 18. His lifetime earnings are bunched into relatively few peak-earning years. During these years he is in a higher income tax bracket.

"Over a lifetime, then, he pays more taxes than a man who earns the same amount over a longer period, and he cannot finance any part of a pension out of tax free business expenses."

RURAL DOCTORS REPORT ON EFFECTIVE HEALTH PROGRAMS

Two rural doctors who have been recognized nationally for their achievements as family physicians appeared on the program at the sixth annual Rural Health Conference held in Memphis, February 23-24.

The conference brought together more than 700 farm and health leaders from all over the country for a discussion of rural health problems. The meeting was sponsored by the Committee on Rural Health of the American Medical Association in cooperation with national farm organizations.

One of the speakers was Dean S. Luce, M.D., Canton, Mass., who at the American Medical Association Clinical Session in Cleveland last December was voted the outstanding general practitioner of the year.

Another speaker was George F. Bond, M.D., Bat Cave, N. C., central figure of the *Reader's Digest* documentary film, "M.D.—The U. S. Doctor."

PITFALLS IN THE MANAGEMENT OF NODULAR GOITER

ROBERT W. BARTLETT, M.D.
ST. LOUIS

PITFALLS IN THE management of nodular goiter are numerous and one can hope to recognize them as they are encountered only if one has a clear understanding of the various ways in which this type of goiter can produce damage to the individual.

It is the impression of many authorities that possibly a third of all nodular goiters will at some time during a patient's life become thyrotoxic and it is a well known fact that the onset of toxicity may be so insidious that some degree of cardiac injury may have developed before symptoms of overstimulation bring the patient to the physician for diagnosis and treatment. This then is the first good reason for not neglecting a nodular goiter.

I should like to emphasize again the point that no certain basal metabolic rate can be selected arbitrarily as the dividing line between toxic and nontoxic since in most instances one does not know what a particular individual's basal metabolic rate was when in normal health.[1] For example, one who has a rate of minus 15 per cent in good health and whose metabolism rises to plus 15 per cent as a result of thyrotoxicosis is just as sick clinically as the person whose rate rises from his normal of plus 10 per cent to plus 40 per cent. Both of these individuals attain an equally gratifying relief of symptoms from thyroidectomy. Next, injury to the individual may be produced by mechanical pressure on the trachea resulting in difficulty in breathing, on a recurrent laryngeal nerve causing voice changes, and on the esophagus leading to difficulty in swallowing. In regard to tracheal compression, occasionally one is compelled to do an emergency thyroidectomy for relief of respiratory embarrassment in instances of acute hemorrhage into an adenoma.

Finally, there are certain facts which now seem quite well established in consideration of the important question of malignant degeneration in nodular goiters. Carcinoma is relatively uncommon in toxic nodular goiter and there is no evidence to indicate any direct relationship between the two. The prevailing opinion is expressed by Pemberton[2] when he says, "Carcinoma of the thyroid gland has no constant effect on the basal metabolic rate and since commonly the carcinoma involves only part of the gland, it seems obvious that the variations in the level of the basal metabolic rate are dependent on the type of the coexistent benign thyroid tissue rather than on the malignant tumor." Carcinoma of the thyroid occurs commonly in nontoxic goiter and considerably more often in the solitary adenoma than in the multinodular gland. Cole[3] reported an incidence of 17 per cent with 9.8 per cent of the multinodular glands and 24 per cent of the solitary adenomas being malignant. Crile's[4] series showed a 10.9 per cent incidence in nontoxic goiter, again with 24 per cent of the solitary nodules and 3.4 per cent of the multinodular glands being cancer at the time of operation, while most recently Hendrick[5] reports 4.7 per cent of the multinodular and 15.7 per cent of the discrete adenomas as being malignant.

Even more impressive than these figures are the reports of Kennedy[6] and Ward[7] showing an incidence of carcinoma in nodular goiter of 20 per cent and 40 per cent, respectively, in children 14 years and under. These figures are higher even than for adults; however, the grade of malignancy is usually low and consequently the outlook for cure good.

The misunderstanding which existed in the recent past regarding the so-called "lateral aberrant thyroids" has now been cleared up by the recognition of the fact that these masses are in reality cervical lymph node metastases from a primary papillary carcinoma in the thyroid lobe of the same side. Often the patient presents herself because of the presence of metastatic masses beneath the sternomastoid but, invariably, subsequent careful pathologic examination of the excised thyroid lobe of that side will uncover the primary lesion which at times may be no larger than a pea. The treatment of the lesion will be discussed more completely a little later.

The fact that pathologists report a low incidence of carcinoma of the thyroid in autopsy material means little since, just as in the case of cancer of the breast, the patient survives the operation of thyroidectomy or biopsy only to die at home, rather than in the hospital, at a later date if cure of the cancer is not obtained.

There are numerous pitfalls for the unwary in connection with the diagnosis of cancer of the thyroid which I believe can be made preoperatively with certainty only when surrounding neck structures have been invaded so extensively that a fixed inoperable mass is present. I feel that malignancy should be strongly suspected, however, when there has been recent rapid growth of a goiter with perhaps slight discomfort in the neck, the development of hoarseness or cough from pressure on or invasion of a recurrent laryngeal nerve, or symptoms of pressure on the trachea or esophagus. It must be remembered that rapid enlargement and discomfort are frequently due to hemorrhage into a cystic adenoma and that calcification simulates the hardness of some carcinomas.

The importance of making the correct diagnosis at operation cannot be overemphasized since no type of subtotal procedure can be regarded as adequate therapy. When the disease is unilateral, total lobectomy—including resection of the isthmus after first isolating the recurrent nerve—is sufficient but, if the disease is extending across the isthmus, total thyroidectomy should be carried out. If lymph nodes are involved, as shown by biopsy,

Assistant Professor of Clinical Surgery, Washington University School of Medicine.

radical neck dissection followed by x-ray therapy must be performed in addition.

It is common knowledge that about 70 per cent of thyroid malignancies are of the low grade papillary carcinoma and malignant adenoma types. Crile,[8] others and I[1] have pointed out that in general the eventual outcome in a given case depends to a large extent on the grade of malignancy rather than how soon the operation is carried out after the nodule is first discovered. It goes without saying that in addition to this an adequate rather than incomplete primary operation is mandatory if one is to avoid the pitfall of local recurrence which may invade vital structures, may metastasize and which is far more difficult to remove satisfactorily than the primary tumor.

For many years operation when carried out in experienced hands has been the treatment of choice for thyrotoxicosis, both in nodular and primary hyperplastic goiter, and the reasons for this may be enumerated as follows: (1) Cure is obtained quickly, which means that in the patient who is moderately thyrotoxic the preoperative medical treatment lasts about two weeks and the subsequent hospital stay during which operation is carried out occupies one additional week, after which the patient is well on the way to normalcy. In the occasional patient who is severely toxic and who therefore requires propylthiouracil as a safety factor in addition to Lugol's solution preparation, there will be an additional two weeks before operation is carried out. Therefore, the vast majority of cases require a total of between three to five weeks to obtain complete cure. This is economical of time and money and eliminates numerous office visits over a prolonged period. (2) When nodular goiter is associated with thyrotoxicosis, only by surgical procedure are the nodules removed and as a corollary of this is the threat of malignant degeneration of this type of goiter eliminated. (3) In experienced hands, operation for toxic goiter provides approximately 95 per cent good results with an accompanying 3 to 4 per cent of serious complications, such as temporary or permanent hypoparathyroidism, recurrent nerve injury, or recurrence of the goiter. (4) A thyroidectomy mortality of less than 0.5 per cent can now be counted upon and there is no field of surgery in which the results are more gratifying than in the treatment of thyrotoxicosis.

Authorities on the subject are now agreed that the greatest value of the antithyroid group of drugs lies in the preoperative preparation of the severely toxic cases and that their usefulness as a curative agent is extremely limited because the rate of reappearance of toxic symptoms is so high after discontinuance of the drug.

Let us now compare the results of surgery with those to be expected following adequate treatment with radio-iodine. (1) It is unquestionably true that atrophy of the thyroid gland can be obtained following the administration of this substance but, ordinarily, complete remission of symptoms is much slower and usually requires between three to six months for its attainment. (2) As in surgery, an occasional patient dies while receiving the course of radio-iodine, though I do not at all suggest that the substance itself is the cause of death. (3) In thyrotoxicosis associated with nodular goiter the precursor to the development of carcinoma is not eliminated by radio-iodine 131, nor in those instances in which mechanical pressure is present is relief obtained for them. (4) Finally, and most importantly, one must ask what will be the long term effect of this considerable systemic irradiation upon the individual: Will there be an increased incidence of the development of carcinoma in the thyroid and other glands as a result of it? What fetal abnormalities may be seen in the distant future as the result of irradiation of the ovaries and testicles of parents or grandparents? Radiation damage as it has been known in the past, such as the development of skin cancer from overexposure to x-radiation, has ordinarily manifest itself several or many years after the exposure. Therefore, as emphasized by such authorities as Rawson, Keating and Nickson, the responsibility for what happens in the future rests with those administering radio-iodine today. This suggests that after the initial studies have been made in the several groups of patients comprising this valuable experimental work, a moratorium be declared for a few years on the administration of radio-iodine on any extensive scale until it can be determined what the fairly long range effect on humans is going to be.

For the many reasons enumerated, thyroidectomy with its splendid results remains the treatment of choice, especially for nodular goiter.

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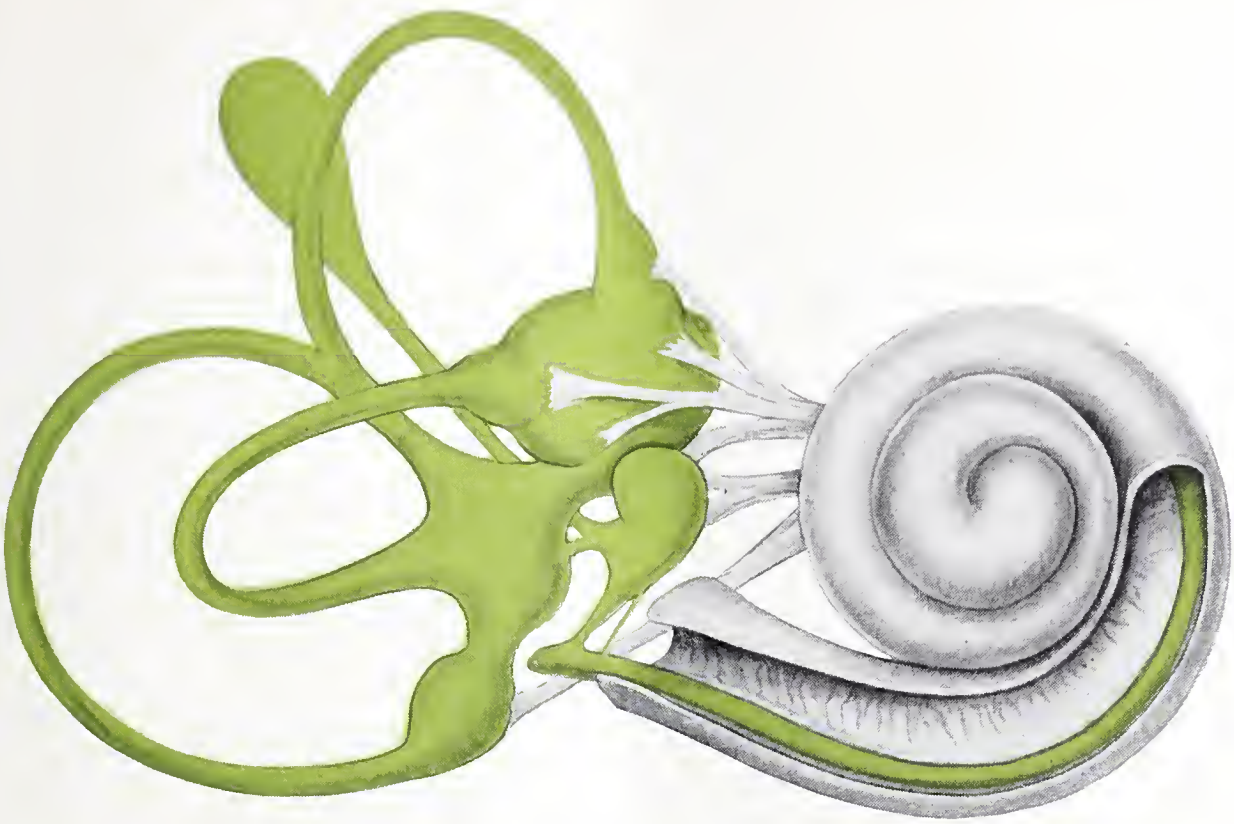
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Postgraduate Review

PROCTOLOGY

FRANCIS J. BURNS, M.D.
ST. LOUIS

A FEW OF the more common proctologic conditions frequently encountered will be discussed. Included are: hemorrhoids, fissures, abscesses and fistulae, pilonidal sinus and cyst, pruritus ani, nonspecific ulcerative colitis, diverticulitis and carcinoma of the colon and rectum.

HEMORRHOIDS

The most common proctologic disorder encountered is hemorrhoids. The treatment of hemorrhoids in the main has consisted of either excision or sclerosing injections, with the preponderance of opinion favoring excision.

The only method offering a cure is hemorrhoidectomy, though sclerosing therapy does have its place in selected cases, more particularly in pregnancy, invalidism and refusal of operation. There are those, nevertheless, who claim as good results with sclerosing therapy as with any other type of treatment but, in general, the results of sclerosing injections are not lasting. The use of sclerosing injections in the treatment of hemorrhoids is still a controversial subject among proctologists.

There are numerous methods of performing a hemorrhoidectomy, some quite radical, others less so, but, however it is done, a popular method is one that leaves open wounds and mucocutaneous bridges between the excised areas.

Acute thrombotic external hemorrhoids, frequently seen, are still treated in many instances by incision of the skin over the tumor, under local anesthesia, followed by expression of the clot. A better method, suitable for either the office or clinic, is excision of the clot, including the external hemorrhoid. It will not then recur, at least at that particular site.

Complicated internal hemorrhoids which have become prolapsed, thrombosed, ulcerated or strangulated, with perianal edema, are best treated palliatively by the application of wet dressings. Operation is deferred for several days until the infection and edema have subsided.[1]

Only small and uncomplicated internal hemorrhoids are treated by injection. Two of the most widely used sclerosing agents for many years have been phenol in almond oil and a 5 per cent solution of quinine and urea hydrocloride.

Terrell and Chewning,[2] tabulating the results of a questionnaire sent to the 355 active members of the American Proctologic Society, found that the "current trend appears to indicate a slight waning of enthusiasm for the use of the injection treatment of internal hemorrhoids." They also note, however, that a high percentage of symptomatic cures can be achieved with injections in properly selected cases.

Pfeifer[3] concludes that injection therapy using 5 per cent phenol in oil cures a fairly large proportion of patients with simple, first degree hemorrhoids, but that a patient is discharged as cured following a hemorrhoidectomy with a definitely greater assurance that recurrence will not occur than is possible after the injection therapy.

Cowett[1, 4] has used sodium alkyl sulfate (sodium sotradecol) in a 1 and 2 per cent solution, a new sclerosing agent, and, in his experience, it is superior to other solutions previously employed such as quinine, sylnasol or phenol.

FISSURES

An anal fissure is usually a rather painful condition and one for which prompt relief is sought. The great majority of fissures occur in the posterior anal canal, partly due to the anatomic arrangement there and partly due to predisposing pathologic factors. These will not be discussed. The most common inciting factor usually cited is the passage of hard stool.

Pain is the outstanding symptom in most cases, sharp and knife-like with evacuation, and persisting as a burning, throbbing pain after evacuation. Bleeding may or may not be present and, if it is, is slight in amount.

The diagnosis is not difficult in the average case and is made by simple external examination. A local anesthetic may be used for more thorough examination. A fissure must be differentiated from chancre, chancroid, epithelioma and colloid carcinoma.[5]

Many fissures heal spontaneously if properly treated in the early stages. They may remain healed but, too often, recur, then requiring excision. Measures to hasten healing include local heat, bland diet, avoidance of hard stool and the local injection of an oil soluble anesthetic such as anucaine.[5] Permanent cure can be had by an operation which excises the fissure and any associated pathologic condition and by the preformance of a posterior sphincterotomy.

Chronic fissures, sometimes spoken of as ulcers, may be associated with spasm, fibrosis of the subcutaneous component of the external anal sphincter, sentinel pile and squamous polypi (hypertrophied papillae).[6] The treatment of this type of fissure is always surgical.

ABSCESSES AND FISTULAE

Abscesses about the anus or rectum should be drained as soon as the diagnosis is made. To temporize with such cases not only allows for more tissue destruction, possibly making cure of a subsequent fistula more difficult, but may also lead to septicemia. The latter, though, with the antibiotics now available, is not so dangerous.

From the Department of Surgery, St. Louis University School of Medicine.

Granet[7] states that in most instances an anal fistula results when a perianal abscess has been incompletely drained by local incision. Inasmuch as a perianal abscess is the precursor of a fistula, it is essential that concurrent with surgical drainage of the abscess the associated infectious source in an anal crypt, duct or intramuscular gland be sought for and excised. If this is accomplished, a fistula cannot result. He concludes that anal fistulae probably can be prevented in most instances if acute perianal abscesses are drained early and completely from "stem to stern."

Young[8] mentions that operation is the treatment of choice for anorectal fistulae. He says that the time honored seton need not often be resorted to if the three following precautions are carefully observed: (1) preoperative bowel preparation; (2) accurate severance at right angles to their course of the sphincter fibers under which the fistulous tract has burrowed is essential, (3) a fistula wound should not be packed with gauze during its healing phase.

Hirschman[9] emphasizes the value of the use of a seton in deep or complicated fistulae, and condemns the use of continued packing of postoperative fistula wounds.

In determining the extent of fistulae the injection of topogesine, which can be colored if desired, and stereoscopic lipiodol injections together with careful probing of the tracts can be informative, according to Gorsch and Becker.[10]

In discussing mucinous carcinoma associated with fistulae, Skir[11] says that the chronicity of a fistula should make one aware of the possibility of malignant change. Furthermore, there are fifty cases of fistulae on record in which malignancy evidently supervened. Whether or not the reported cases really represent cancer formation in pre viously benign fistulae, it is safest to eradicate fistulous tracts as early and as completely as possible.[11]

PILONIDAL SINUS AND CYST

The bulk of the literature on this subject, as it has for many years, centers around the treatment.

Theories are still discussed as to the origin of the condition. the theory of nerve origin, and the theory of ectodermal invagination being the two most popular.[12]

The diagnosis is usually easy, though it may be confused with an anal fistula, furuncle or sebaceous cyst.

Buie[13] popularized the marsupialization type of operation and, since the advent of the last war, this type of operation is being done more frequently. Freund and Redding,[14] after using this method in Army hospitals, propose that it be done more frequently. Brust[15] used a modification of the marsupialization or exteriorization method on 1,014 cases of pilonidal cyst and obtained a cure in 94.7 per cent.

On the other hand, Berkowitz[12] claims that best results have been obtained by excision and open packing.

Using a method of primary closure after excision, Larsen[16] obtained secondary healing in only seven of 225 consecutive cases, and Wenger,[17] in a series of 90 consecutive cases, showed that primary closure is the method of choice in treatment.

Ewell[18] uses the McCutchen operation, a plastic type of procedure, in certain complicated cases. Harberson and Brintnall[19] advocate the use of a skin flap to cover the defect after excision of the cyst.

Parker, Menaker and Miller[20] emphasize the importance of preoperative and postoperative care, and adherance to the three fundamental surgical principles of complete excision, absolute hemostasis and obliteration of the space.

Bellis[21] describes a method of treatment, successful without exception, in 315 cases of pilonidal cyst, in many of which the patients had undergone one or more previous operations. Briefly, the cyst and its communicating tracts are laid open and cut out. The skin edges are then sutured on each side to the sacrococcygeal fascia in the midline region of the cyst bed. When the operation is complete, the suture lines are a pattern of the original cyst and its ramifications.

Tendler and McGehee[22] almost routinely employ the conservative method of dye injection and block dissection followed by open packing. Primary closure is done by them only when the lesions are small and have not been recently inflamed. In a series of 145 cases, there were nine cases of delayed healing and only one true recurrence.

For infected pilonidal cysts, Crile[23] incises and drains the abscess, then leaves a short section of a mushroom catheter in the cavity to maintain drainage. He treated 12 cases with this method with uniform success.

Antibiotics have definitely aided in the treatment of many cases, especially in allowing more cases to be successfully closed primarily than were possible before these drugs were available.

PRURITUS ANI

As in the case with pilonidal sinuses and cysts, most of the attention to pruritus ani has centered around its treatment.

There may be any one of many causes for this sometimes distressing condition, but it cannot be denied that a moist perianal skin, either as a primary condition or secondary to some other condition, is a contributing factor. Food allergy may be a cause of pruritus according to Rugeley.[24] In his series of cases wheat, eggs, beef, milk, figs and tomatoes were, among a few others, offenders.

Friedman, Haskell and Snape[25] claim that local applications of a paste made from aluminum hydroxide gel brought prompt sustained relief to ninety-three of ninety-eight patients (94.8 per cent) with the "moist" type of pruritus ani, but

was effective in only two of thirty-six (5.5 per cent) with the "dry" type of pruritus ani. They say that the beneficial effects of the aluminum hydroxide are probably due to the absorption and inactivation of the proteolytic enzyme or other chemical irritant in the anal drainage fluid.

Laymon and Schmid[26] used thephorin topically and found it especially effective in anogenital pruritus with lichenification. Of 305 patients suffering from a variety of pruritic dermatoses, 76.4 per cent were helped, with 62.3 per cent deriving good to excellent results from thephorin salve, according to Shelmire.[27]

Peck and Michelfelder[28] used 10 per cent N-ethyl-o-crotono-toluide in a water soluble ointment base and found it to be of value in the control of the pruritus in various dermatologic conditions. Combes and Soperstein[29] state that the apparent synergism of ethyl-aminobenzoate and amyl-aminobenzoate makes it possible to use them as surface anesthetics for the relief of pruritus and pain.

Epstein[30] has used intravenous injections of aminophylline and obtained immediate complete relief of itching in 80 per cent of thirty patients treated. However, he says the effect is greater in acute than in chronic pruritic dermatoses.

In recent years the antihistaminic drugs have been used in treating pruritus ani. Baer, Sulzberger and Witten[31] report favorable results with pyribenzamine and benadryl, and Frankfeldt[32] claims pyribenzamine will control itching in the majority of patients.

Kierland and Potter[33] worked with thenylene and found the results similar to those obtained with pyribenzamine and benadryl.

Turell[34] advocates tattooing of the perianal skin with mercury sulfide and reports effective relief, especially in those cases presenting definite characteristic cutaneous changes.

On the basis that pinworms might be a cause of pruritus, Jenkins[35] advocates the oral and local use of gentian violet.

Larkey[36] outlines a rather simple and effective method of treatment, one that is commonly used and one that will provide relief in a great many cases. Following is a brief outline of his form of treatment.

After a thorough history, proctologic examination and correction of any anorectal disease, the involved area is painted with Ag NO_3 solution followed by gentian violet, or a saturated solution of KMnO4. The patient is instructed to care for the involved area at home via proper rectal hygiene. which is the most important single measure in the management of this condition, and includes cleansing the perianal area with wet cotton, drying with soft tissue, then powdering the area with cornstrach or boric acid powder. Constipation is treated by the use of smooth bulk laxatives and the patient required to avoid all spicy foods and alcoholic beverages. The use of a drying and healing ointment consisting of phenol, icthyol, and coal tar (in a suitable base) once or twice a day is also helpful. All instructions are written.

There are cases of chronic pruritus ani that will not respond to conservative therapy of any kind and, in many of these, some operative procedure may be effective. Wilson[37] describes a modification of the Ball operation in which radial incisions are used and oxidized cellulose is used as packing. Rosser[38] also uses a modification of the Ball operation and implants "gelatin foam" under the perinal skin.

NONSPECIFIC ULCERATIVE COLITIS

This disease remains a challenge to medicine, mainly because the etiology is still unknown. The majority of cases, approximately 60 per cent,[39, 40] are primarily medical problems and to the medical armamentarium have been added some of the newer drugs. The results of medical therapy have shown remarkable improvement in the last ten to fifteen years, with a high mortality rate remaining only in the acute and fulminating cases.[41]

Bargen[42, 43] outlines the general medical treatment, in which there has been no essential change, and his specific therapy includes an autogenous vaccine from the organism found in the rectal ulcers in each case, azosulfamide (neoprontosil), phthalysulfathiazole (sulfathalidine) and salicylates. He says that operation in this disease should not be performed unless complications are present. The most common causes of relapse, according to Bargen[42] are: (1) infection of the upper part of the respiratory tract, (2) mental and physical trauma, and (3) the lighting up of distant foci of infection.

Machella and Miller[44] advocate intubation of the bowel with a Miller-Abbot tube ("medical ileostomy") and the oral administration of a solution of equal parts of an enzymatic casein digest and of dextri maltose.

Martin[45] reported four cases of ulcerative colitis treated with thiouracil in which he obtained clinical benefit in all cases and improvement in the ulceration of two. Later examination revealed improvement in the remaining two. Roehlke[46] reported a case of chronic ulcerative colitis which showed clinical improvement when treated with propylthiouracil.

Haskell and Friedman[47] administered orally extracts of hogs' small intestinal mucosa in 71 patients. Of these patients, twenty-seven were followed for a year or longer and improvement was noted in twenty-four.

Of the sulfonamide group, sulfathalidine appears to be the drug of choice, with sulfasuxidine being a close second.[48] Heineken and Seneca,[49] using sodium phthalyl sulfacetamide, noted improvement in the treatment of twenty-eight cases of ulcerative colitis.

Penicillin, when given parenterally, is generally ineffective; streptomycin is not yet clearly evaluated.[48] Chloromycetin and aureomycin both show

promise of effectiveness in the treatment of ulcerative colitis, but results are not yet available.

Major[50] claims that his experience with nisulfazole in the treatment of ulcerative colitis has been encouraging. It has given much better results than any other treatment with which he was familiar. Broun[51] has also had some success with nisulfazole.

Kirsner, Palmer and Klotz[52] have used ASTH and cortisone in the treatment of chronic ulcerative colitis and conclude that these drugs appear to be useful adjuncts. The beneficial effects induced by ACTH, however, surpassed those of cortisone.

The usual indication for surgical intervention in this disease is the failure of the patient to show satisfactory improvement after adequate medical treatment, but just what constitutes this must be determined in each case. Most surgical opinion favors ileostomy as a primary procedure, followed by excision of the diseased bowel later, if indicated, and if the patient can stand it.[53, 54, 55, 56, 57, 39] At the present time a permanent ileostomy must be accepted as the price of a good result. With the Koenig-Rutzen bag, an ileostomy does not constitute a great disability.[58]

Dennis, Eddy and Westover,[59] Dennis, Eddy, Frykman, McCarthy and Westover,[60] and Fansler and Frykman[61] have used vagotomy in the surgical treatment of ulcerative colitis. The response was favorable in most cases, more particularly in those cases in the acute phase and those with good bowel elasticity. Those with much fibrosis of the bowel wall did less well.

Complications of chronic ulcerative colitis to be kept in mind are: polyps, strictures, malignant degeneration (5 per cent of 2,000 cases at the Mayo Clinic,[62] 3.8 per cent of 316 cases at the Cleveland Clinic,[63]) perforation, perforation with formation of a fistula, massive hemorrhage, renal injury, fatty change of the liver, interstitial pancreatitis,[62] and spreading ulceration of the skin.[64]

DIVERTICULITIS

LeRoyer and White[65] noted the occurence of low back pain as a prominent feature in 20.5 per cent of cases of diverticulitis of the colon. This is usually not listed as a common symptom.

Occult blood in the stool is common in the experience of Fallis and Marshall.[66] They say it is just as frequent in diverticulitis as in carcinoma and thus is of little diagnostic significance. In a series of ninety-four cases, they report that 41.3 per cent exhibited blood in their stools. LeRoyer and White[65] noted the presence of melena in 16.5 per cent of cases; Goodwin and Collins[67] in 4.9 per cent of 726 cases; Morton[68] in 32 per cent; Ochsner and Bargen[69] in 22 per cent; and Smithwick[70] in 15.7 per cent. Formerly bleeding was not regarded as a common sign.

Fallis and Marshall[66] advocate the use of tetraethylamonium chloride as an aid for x-ray study of the colon. It eliminates muscle spasm in visualizing diverticula and, therefore, is of assistance in differentiating between inflammatory lesions and neoplastic lesions of the colon.

The newer antibiotics are of little help in direct attack upon the inflamed bowel. However, they do lessen the morbidity by better control of infection and of some of the complications.

It is generally agreed that uncomplicated acute diverticulitis should be treated medically, while the complications (perforation, obstruction, fistulae) should be treated surgically.[71, 72, 73] Transverse colostomy is the operation of choice.

Babington,[74] however, strongly advocates early operation on cases of acute diverticulitis. He claims that when diverticula of the colon are inflamed they produce the same type of symptoms as the inflamed appendix, but that the complications of diverticulitis are more serious than those of appendicitis. Patients with acute diverticulitis of the colon should be operated upon as early as possible, he says, before peritonitis, abscess or perforation have set in. Such early surgical intervention avoids complicated surgical procedures which often have to be repeated over a period of years with doubtful and uncertain results.

Many complications of diverticulitis can be prevented by early resection of the diseased segment of bowel.[75]

Stewart[73] emphasizes the necessity of staged procedures in treating complicated cases with perforation.

CARCINOMA OF THE COLON AND RECTUM

The lower bowel is probably neglected more often than any other accessible area of the body and, yet, as Scarborough[76] says, "the possibility for permanent cure is greater for cancer of the large bowel than for cancer anywhere else within the body." Approximately 12 per cent of all malignant tumors of the body are found in the anus rectum and sigmoid,[77] and of 37,863 cases of cancer in the State of Connecticut from 1935 to 1946, cancer of the colon and rectum represented 15.4 per cent (skin excluded).[78] (In this same series cancer of the breast, uterus, stomach and lung were less frequent than cancer of the colon and rectum.)

It should be reemphasized that 75 per cent of all cancers of the colon and rectum are within reach of the examining finger or sigmoidoscope. The average duration of symptoms is still about nine months, hence delay in reaching a diagnosis of early lesions is not always the physician's fault. However, delay is due, more often than not, to failure to take a careful history of signs and symptoms and to follow it with a thorough examination.

Scarborough,[76] Daniel,[79] and Craig[80] emphasize that many, if not all, cancers of the colon and rectum originate in benign adenomatous polyps and that their discovery and eradication are important phases of preventive medicine.

The use of cytologic methods holds promise of

yielding a higher incidence of correct diagnoses than any of the routine clinical methods now employed.[81]

Present day improvement in operability rates, resectability rates and survival rates are due, not so much to the procedure used, but to better planned preoperative and postoperative measures. Antibiotic therapy has been the greatest single improvement in surgery of the colon and rectum.[82, 83, 84, 85] Sulfathalidine, sulfasuxidine and streptomycin remain the drugs of choice. More recently Crile and Turnbull[86] quote Dearing and Heilman[87] as saying that aureomycin is the most effective drug in reducing the bacterial count in the stool. Furthermore, they note that it is also absorbed and is effective in controlling cellulitis and infection in the tissues around an ulcerating lesion.

Graham[88] notes that the trend for revival of interest in operations upon the rectum that include preservation of the anal sphincter seems to have been transient. However, in suitable cases, there is a steadily growing tendency to perform single stage rather than multistage operations for lesions in every segment of the large intestine.

Dixon[89] is still a strong advocate of the anterior resection with anastomosis for lesions of the upper part of the rectum and lower part of the sigmoid. Bacon[90, 91, 92, 93, 94] and Babcock[95] are the strongest exponents of the "pull through" type of operation with preservation of the anal sphincters.

White[96] describes a combined abdominococcosacral operation for cancer of the rectum, using a posterior type of anastomosis.

Lahey[97] and the late T. Jones[98] favor the more conventional, and more radical, abdomino-perineal type of operation and Gabriel[99] the perineo-abdominal type.

Others, namely Hunt,[100] Best[101] and Standard and Mulholland[102] are more or less on middle ground in their treatment of lesions of the lower sigmoid, rectosigmoid and upper rectum. They tend to individualize the cases regarding the type of operation.

Black[103] describes a combined abdomino-endorectal resection for certain types of carcinoma of the midrectum and upper part of the rectum.

Regarding prognosis of carcinoma of the rectum and sigmoid colon, Kirklin, Dockerty and Waugh[104] conclude that the location of the lesion with reference to the level of the peritoneal reflection has no effect on prognosis.

Thompson [105] reported a case of a carcinoma of the rectum with secondary involvement of the penis, the fourth such case in the literature.

Lott and Alexander[106] reported a case of a basal cell carcinoma of the anus. A total of nine such cases have been reported in the literature.

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EMERGENCY DOCTOR CALL SYSTEM HAS RAPID GROWTH

Medical societies in 329 communities have established night and emergency doctor call systems, according to a report by the Board of Trustees of the American Medical Association. A survey made in the summer of 1948 had shown only sixty such plans in operation.

"While these plans vary greatly according to the size of the community, they all have the same purpose—to guarantee that the people of the community can obtain a doctor at any time of the day or night, any day in the year," it was stated by Dr. Louis H. Bauer, Hempstead, N. Y., chairman of the Board of Trustees.

"The systems are so efficient that even in New York County, which operates the largest emergency call system in the country, it requires no more than seven or eight minutes to have a doctor on his way to answer a call."

Dr. Bauer added that the board "urges all county medical societies that have not yet established a formal plan for answering night and emergency calls make that a completed project during the coming year."

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Clinical Conference

CLINICAL PATHOLOGIC CONFERENCE

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OTTO SAPHIR, M.D., *Chicago*

Plasmocytoma

History.—(Presented by F. G. Stephens, M.D., McMillan Hospital, St. Louis). This 52 year old white man was referred to an otolaryngologist for treatment of sinusitis. During the course of physical examination a tumor of the epiglottis was noted. This was pale red in color and consisted of a mass on the laryngeal surface, measuring about 1 cm. in diameter. There was no involvement of adjacent structures.

DISCUSSION

Otto Saphir, M.D., Chicago: This section (figs. 22 and 23) shows invasion of the derma and subcutaneous tissue by an extremely cellular tumor. The cells vary considerably in size and shape. Giant tumor cells containing as many as four nuclei are numerous. The cells are oval, or polygonal, with abundant, intensely basophilic cytoplasm. Adjacent to the nuclei, occasional pale round areas are seen. The nuclei are eccentric, round or slightly oval with a prominent central nucleolus. The chromatin is coarse and darkly staining and clumped around the nuclear membrane. The cells are separated by small amounts of fine connective tissue. There is hemorrhage into the tumor.

I called this a plasmocytoma on the basis of having seen a similar case before. The lesion is characterized by diffuse infiltrations of large cells with eccentric nuclei. The chromatin is clumped and, only rarely, does the nucleus actually resemble a cartwheel. The cytoplasm is slightly basophilic. There are a number of multinucleated cells. I believe that this is a benign tumor. I have seen only one plasmocytoma occurring in the tonsils. This case was eventually reported by Frank.[1]

Ewen considered these tumors as usually benign. Accumulations of plasma cells, seen in instances of chronic inflammation, are usually known by Boris' term "granuloma plasma cellulare." Helwig,[2] in an extensive general study on extramedullary plasma cell tumors, reported 127 published cases of this type. Of these sixty-three originated in the upper respiratory tract. Hellwig concluded that if the plasma cell is considered a differentiated lymphocyte, then the extramedullary plasma cell tumor falls into the lymphoma group. He believed that the extramedullary plasma cell tumor, despite the typical cell structure, might range from a nonmalignant to a highly malignant growth. He found nine such tumors of the air passages with metastases to bones. He remarked that some investigators regard the extramedullary plasma cell tumors as being fundamentally the same as multiple myeloma. He disagreed because it appeared to him that plasma cell tumors, observed for many years, always remained benign and localized, particularly those occurring in the mucous membrance. Recently, Stout and Kinney[3] studied primary plasma cell tumors of the upper respiratory tract and oral cavity. In their extensive review they found four instances in which the larynx was involved. From their study they concluded that a plasma cell tumor can and does display infiltrative growth. Such tumors definitely occur in the nasal and oral mucosa. The involvement of bone marrow may be explained either on the basis of true metastasis, if they are malignant, or as new lesions similar to the primary tumor since they are usually found where potential plasmocytogenic cells exist. They concluded that the plasma cell proliferation of the oral and nasal cavity are plasma cell neoplasms with either solitary or, rarely, multiple manifestations; they can metastasize to regional lymph nodes; they are sometimes associated with solitary or multiple involvement of bones. It is interesting that of the four cases of laryngeal tumors, there was recurrence twice in one instance. However, following x-ray treatment, the patient was free from symptoms for fourteen and one half years. This would indicate that such tumors do recur and that irradiation therapy is indicated in each recurrence.

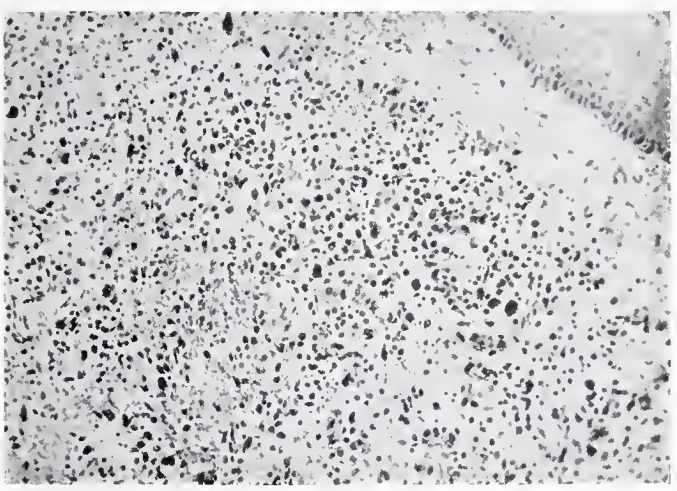


Fig. 22. Note the submucosa severely infiltrated by cells resembling plasma cells. Some of these are multinucleated.

This is a rare tumor. I believe that these tumors in the oral cavity are not related to multiple myeloma of bones. They are local manifestations of a peculiar type of lesion.

In these slides there is invasion of the derma and the subcutaneous tissue by an extremely cellular tumor. There are occasional giant tumor cells with as many as four nuclei. The cells are oval or polygonal. At times, the eccentricity of the nuclei is distinct, the chromatin is coarse and clumped

From the 1950 Tumor Seminar held at the Ellis Fischel State Cancer Hospital, Columbia, conducted by Otto Saphir, M.D., Chicago. Other cases have been carried in earlier issues of The Journal. These two cases conclude the Seminar.

around the nuclear membrane. The cells are separated by small amounts of fine connective tissue.

Lauren V. Ackerman, M.D., St. Louis: I have seen a fair number of such tumors in the upper air passages and I would say that as a group they grow more slowly than the usual multiple myeloma (Stout). It is not at all uncommon for these patients to eventually develop the typical clinical picture of a multiple myeloma. In my limited experience, those cases in which the tumor was in the upper air passages and in which there were giant

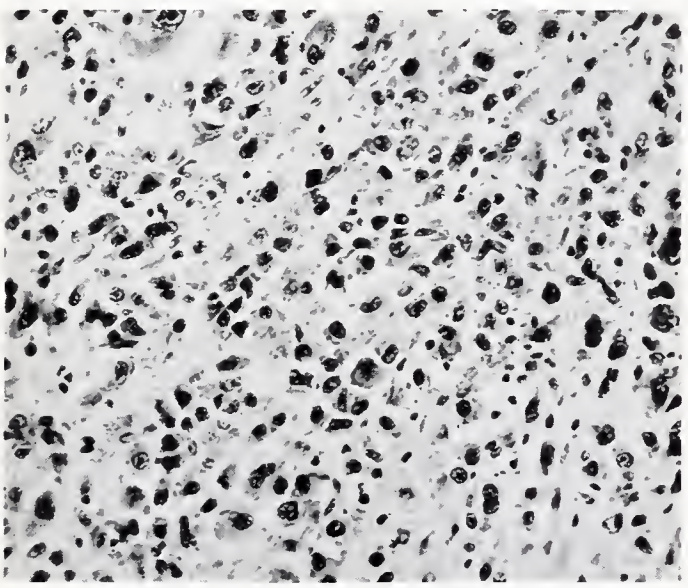


Fig. 23. Higher magnification of similar field.

cells and variations in size and shape have proved to be uniformly more malignant than the group in which the plasma cells are easily recognized and quite uniform. In this latter group it is difficult to predict the prognosis. Next, I think that it is important for everyone to realize that such a neoplasm as this is radiosensitive and radiocurable if it is localized. If there is no occult focus, there is a chance of cure or arrest. We have also had the experience of seeing a patient in whom the primary manifestation of a diffuse plasma cell myeloma was within the oral cavity. As I see these different cases, plasma cell tumors arising in soft tissues, perhaps single foci in bone, or even plasma cell leukemia (usually an acute process) they appear to represent nusances of the same process proceeding at variable speeds. I am more disposed to look at this as all the same problem rather than as multiple problems.

M. D. Wheelock, M.D., Chicago. How frequently do you see plasma cells in the peripheral blood, and how often do you see plasma cells in the peripheral blood in diffuse plasma cell myeloma?

Dr. Saphir: I do not know. I would say rarely in my limited experience with the blood picture.

Dr. Ackerman: One does see true cases of plasma cell leukemia; there are about thirty-five of these in the literature. In multiple myeloma one rarely finds plasma cells in the peripheral blood. Few hematologists search assiduously for the plasma cells in the blood stream. In cases of this nature, I think it would be unlikely to have the cells in the peripheral blood and I think it is important, given a patient of this nature, that the case be investigated thoroughly to be sure there is no dissemination. The serum proteins, bone marrow biopsy and Bence-Jones protein should be done. If these findings are negative, the patient may have a better chance of having a single localized lesion.

Dr. Saphir: Is it not relatively rare in cases of typical multiple myelomas to find extramedullary lesions?

Dr. Ackerman: Yes, it is relatively rare, but there are cases in the literature in which there are lesions of viscera.

Robert Moore, M.D., St. Louis: I think one should not pay too much attention to terminal invasion of blood in various forms of malignant tumors of the hematopoietic tissues. I do not believe that this observation alters the fundamental nature of the disease. We have one example in the files of our Department of Otolaryngology of a plasma cell tumor of the tonsil with a lymph node in the neck which was pure plasma cells. I do not know what has happened to that patient.

Dr. Ackerman: I also saw that patient. At the last follow-up there was widespread involvement of all the flat bones of the skull.

Dr. Moore: That was about four years following the primary diagnosis, was it not? I was just going to say that it is my impression from Hellwig's paper that a considerable percentage of these people with plasma cell tumors of the respiratory passages will eventually show plasma cell myeloma of bone. This patient subsequently died of disseminated myeloma. At autopsy there was extensive involvement of the skeleton.

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Hashimoto's Disease

History.—(Presented by Lauren V. Ackerman, M.D., Barnes Hospital, St. Louis). The patient was a thin, pale, alert white woman, aged 33, who three years ago noticed that the thyroid gland was large. She consulted a physician who thought she had hypothyroidism and gave her tablets. She had noticed a drawing sensation in the throat and over a period of six years she had lost weight from 137 to 111 pounds. On admission, the thyroid was firm and enlarged; it measured approximately 7 by 4 cm. There were many small nodules and one hard 2 cm. nodule in the right lobe. Basal metabolic rate was plus 3. Peripheral blood and urine examinations were normal except for slight anemia of 3.8 ml. red blood count. Serum protein and sedimentation rate and electrocardiogram were all normal. A total thyroidectomy was done.

The gland was encapsulated, weighed 38 grams, and had a prominent tracheal curvature. The ex-

ternal surface was finely nodular and symmetrical. On section, the thyroid was firm, yellow gray and homogeneous.

DISCUSSION

Otto Saphir, M.D., Chicago: The tissue is identified by the presence of a few scattered and atrophic follicles (fig. 24). The lumen contains scanty amounts of variable staining colloid. At times the epithelium is hyperplastic with obliteration of the lumen and absence of colloid. Most prominent are the large lymphoid follicles with large germinal centers and the extensive lymphocytic and plasma cell infiltration surrounding and compressing the acini. Lobulation is mimicked by the thick but delicate and cellular connective tissue. At one margin the masses of fibrous tissue appear to have replaced lobules. The blood vessels show none of the changes resembling the endarteritis seen in so-called Riedel's struma. At times pseudo giant cells formed by a fusion of colloid and epithelial acinar cells can be seen. However, the history, physical findings, gross appearance of the thyroid, and the microscopic picture are all compatable with the diagnosis of struma lymphomatosa or Hashimoto's disease.

I think the differential diagnosis lies between Reidel's struma, Hashimoto's disease and carcinoma. The majority believe that this is Hashimoto's disease, and I agree.

In reviewing the history of this patient one sees that she was a 33 year old woman with two major complaints—a goiter for three years and a drawing sensation in her throat. There was a possibility of hypothyroidism. Clinically, the thyroid was firm and enlarged. Multiple small nodules and a solitary hard nodule in the right lower lobe were felt. There was a slight anemia. The lesion was described as being encapsulated, finely nodular and symmetrical. It weighed 38 grams. The cut section was firm, yellow gray and homogeneous. In the evaluation of the strumas, a clinicopathologic correlation is often needed. In accordance with this, there are two additional facts which I would like to have: (1) the absence or presence of adhesions around the thyroid, and (2) why a total thyroidectomy in this particular instance was done rather than a subtotal thyroidectomy? Does anybody know?

Lauren V. Ackerman, M.D., St. Louis: First, no. As I recall, there were no adhesions. Second, I asked the same question and received no answer. But, because of the hardness of the gland I think there was some question in the mind of the surgeon that this might be a malignant neoplasm. No frozen section was done (for which I am thankful). I would certainly think that a total thyroidectomy was not indicated.

Dr. Saphir: Yes. Since Hashimoto first described this entity in 1912 as "lymphoid goiter" and particularly as contrasted with Riedel's first description of what he called the "Eisenharte Struma" or "struma lignea" in 1896, there has been a battle about the possible relationship of the two diseases. Hashimoto was emphatic that they were two separate and distinct entities. He was supported by Graham[3] who, as you know, has done a large amount of work on thyroid lesions, and by others. Ewing stated that struma lymphomatosa and Riedel's struma and Hashimoto's disease of the thyroid were the same process and classified them as "benign granuloma of the thyroid." Of course, in both Riedel's struma and Hashimoto's disease of the thyroid there are granulomas, probably due to an extravasation of colloid which acts as a foreign body.

Hashimoto's struma, or preferably Hashimoto's

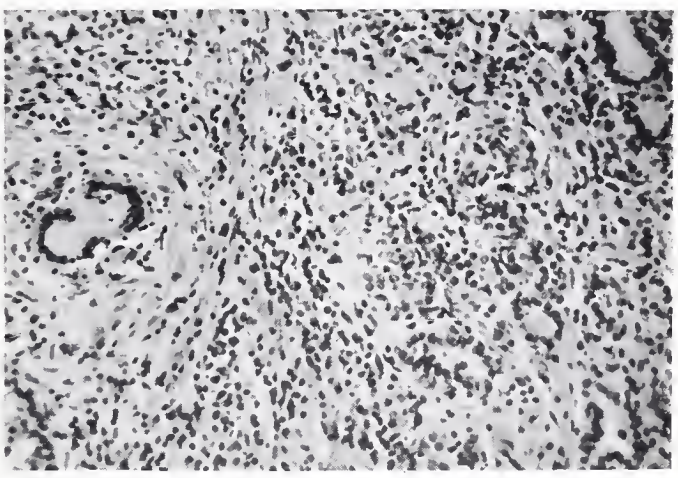


Fig. 24. Note the presence of atrophic follicles, many inflammatory cells and giant cells.

disease, occurs almost exclusively in women, is seen at any age, but chiefly during the third to the fifth decades. It may be attached to the trachea, but there is no adherence to the surrounding structures as is present in Riedel's struma. The consistency is firm and resilient, at times hard, but never as woody as in Riedel's struma.

Microscopically, the acini are small and atrophic with scanty and poorly staining colloid. There is a diffuse lymphocytic infiltration of the parenchyma and large, often numerous, lymph follicles with huge germinal centers. Thick or fine wavy fibrous tissue surrounds the acini and in the late stage there may be a gradual fibrous replacement of the lobules. It is this fibrous replacement which has led to the inference that a relationship exists between Riedel's struma and Hashimoto's disease. Plasma cells, monocytes and often pseudo giant cells are found. The presence of endarteritis and blood vessel changes found in Riedel's struma are not described in Hashimoto's disease.

In contrast, Riedel's struma occurs in a younger age group, usually in the third or fourth decades and is seen both in males and females. There is no tendency to myxedema; the latter occurs only if too much of the thyroid tissue has been removed surgically. The goiter in Riedel's struma is small, hard and smooth. Invariably, there is fixation of the thyroid to the surrounding structures. Removal is so difficult that, at times, the recurrent laryngeal nerves, cartoid artery, jugular vein, esophagus or any one of the adjacent structures may be injured.

Microscopically, the most prominent feature in Riedel's struma is the large amount of dense hyaline and fibrous connective tissue. The acini are compressed and few in number. The arterioles and the arteries are invariably the seat of a severe endarteritis, the end stages of which are identical to those seen in arteriosclerosis.

The etiology of neither disease is known. Struma lymphomatosa is perhaps the result of a constitutional anomaly or the result of metabolic disturbances. There are some references in the literature in which such a disease has been produced experimentally by low vitamin carbohydrate, low vitamin fat and low vitamin protein diets. At present it is impossible to state that the disease produced by such deficiency diets is identical with Hashimoto's disease. In closing, I should like to say that it is often difficult to make a differential diagnosis between Riedel's struma and Hashimoto's disease from one field or from one section alone.

Dr. Ackerman: May I say that I included this slide because I was unable to decide whether it was Hashimoto's disease or Riedel's struma, and my final diagnosis was "thyroiditis." I thought that on the basis of the clinical history and the gross appearance of the specimen Hashimoto's disease was favored. In addition, the absence of any attachment and the symmetrical involvement, according to the surgeons, would be against carcinoma. The lack of adhesions and the diffuse involvement are against Riedel's struma. Riedel's struma is asymmetrical, stony hard, with dense adhesions to surrounding structures. The diffuse involvement and lack of adhesions is for Hashimoto's disease. However, the fibrosis and giant cells are against this disease. I, therefore, favored chronic thyroiditis, often a diffuse process with few adhesions. Microscopically, it may produce a variable picture with giant cells, fibrosis and increased lymphoid tissue.

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3. Graham, A.: Malignant Tumors of Thyroid, Epithelial Types, Ann. Surg. 82:30-44, 1925.

SEVENTH RURAL HEALTH CONFERENCE TO BE HELD IN DENVER IN 1952

Denver has been selected for the seventh annual National Conference on Rural Health, according to an announcement on March 16 by Dr. F. S. Crockett, of Lafayette, Ind., chairman of the American Medical Association's Committee on Rural Health.

The meeting will be held in the Shirley-Savoy Hotel, February 28, 29 and March 1, 1952, and will be sponsored by the committee in cooperation with leading farm organizations. The sixth annual meeting, held in Memphis, Tenn., recently, was attended by more than 600 medical, farm and agricultural extension leaders from all parts of the country.

Out of these conferences, Dr. Crockett pointed out, have developed programs for health improvement in small communities.

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1. Thewlis, M., and Gale, E. T.: Ambulatory Care of the Aged, Geriatrics, 5:331 (Nov.-Dec.) 1950.

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Case Report

TWO FATAL CASES OF SICKLE CELL ANEMIA

WITH AUTOPSY FINDINGS

ROBERT H. RUBY, M.D.
ST. LOUIS
AND
WILSON G. BROWN, M.D.
ST. LOUIS

Sickle cell anemia is a disease which produces progressive changes in the body organs as a result of repeated hemolytic episodes. Two cases of the disease are reported with autopsy findings, one in a child and the other in an elderly man.

Sickle cell anemia and sicklemia are thought to occur only in the Negro. There are nineteen cases reported in persons other than Negroes.[1] These individuals may have been part Negro, or the disease may have been thalassemia, which, except for the crescent shaped sickle cells, resembles sickle cell anemia (anisocytosis, presence of erythroblasts, target cells, increased resistance to hypotonic saline solutions, elevated icterus index and "hair-on-end" bone changes seen on x-ray).

Various studies for sickling of blood cells have been carried out on groups of Negroes, and it has been found that from 5 to 14 per cent of those studied had the sickling trait. Of those whose red blood cells sickle, one in forty will have the disease, sickle cell anemia.

The disease occurs with equal frequency in both sexes. The two cases being reported were in males.

The defect within the red blood cell is, in all probability, an inherited congenital abnormality of the stroma of the cell. A cell must contain hemoglobin before it will take on the bizarre form characteristic of the trait, or the disease.

Janet Watson[8] reported that no sickling occurred of the basophilic or polychromatophilic normoblasts in wet preparations of bone marrow after twenty-four hours. However, in known cases of sickle cell anemia with which she worked, most orthochromatic normoblasts were in a sickled state after that period of time.

In preparations of blood, normoblasts and reticulocytes sickled as rapidly as mature red blood cells, but immature reticulocytes filled by reticulum showed delayed sickling. Watson postulated that the sickling was slower in immature cells because of the lower oxygen tension and because the nucleus and reticulum afforded mechanical interference. However, Singer and Robin,[7] using their rapid test for sickling with cultures of Bacillus subtilis on wet preparations of bone marrow, reported that nucleated red blood cells containing hemoglobin sickled as rapidly as mature erythrocytes.

We wish to express our thanks to R. O. Muether, M.D., for his assistance in publication of this paper.

Neal[4] has added additional information concerning a probable genetic basis for this disease. In a study of forty-two parents of twenty-nine patients with sickle cell anemia, he has postulated that sicklemia is the result of a heterozygous transfer of genes, whereas, sickle cell anemia results from a homozygous transfer. At the time of his publication, thirteen cases in which both parents were tested, and in sixteen cases in which only one parent had been studied, all showed sickling.

Pauling et al[5] found electrophoretic differences in the hemoglobin of normal people, those with sickle cell anemia and those with sicklemia. The hemoglobin of individuals with sicklemia gave an electrophoretic pattern similar to the pattern of a mixture of normal hemoglobin and sickle cell anemia hemoglobin. Their supposition is that the hemoglobin molecule may have a surface region on the globin fraction that has a complementary configuration to another region of the surface of the hemoglobin molecule and that with proper conditions (low partial pressure for carbon dioxide) there is sufficient alignment (a situation analogous to antigen-antibody reaction) to cause distortion of the cell membrane. Thus, he would relate the disturbance to the globin fraction and not to the heme, except that heme must be free of its oxygen.

Sixty-one per cent of the hemoglobin of sicklemia gives an electrophoretic pattern similar to normal hemoglobin and 39 per cent is of the sickle cell anemia hemoglobin type. They postulate that this makes a less stable chain work in the alignment of sicklemia globin than in the sickle cell anemia globin.

SIGNS AND SYMPTOMS

The signs and symptoms of sickle cell anemia are varied. The most frequent complaints in a series of forty-eight cases of sickle cell anemia reported by Grover[2] are joint or extremity pain, abdominal pain, ulcers of the legs, the common cold, neuropsychiatric complaints, weakness, dyspnea, swelling of the abdomen, severe epistaxis and swelling of the legs, with decreasing frequency in the order mentioned. The joint crises stimulate rheumatic fever but the swollen joint does not become hot and the pains do not respond to salicylates. Rheumatic fever in association with sickle cell anemia is casual. The cardiac findings simulate mitral and aortic valvular damage, but autopsy usually reveals no valve damage. In the aged, symptoms of coronary insufficiency, or coronary occlusion are not uncommon. Cardiac enlargement is generally associated with hemic murmurs. In younger individuals the spleen and liver are large enough to feel. Mucosal pallor and jaundice may be present.

Abdominal pain may be slight or it may be severe enough to simulate diseases of the ab-

domen, suggesting the need for surgical intervention.

LABORATORY STUDIES

Clinical tests for the determination of sickle cell anemia, or the trait, depend on changing the hemoglobin in the cells to the reduced state. Sickling will not appear in the presence of oxyhemoglobin or carbon monoxide hemoglobin.

There is only one of the many tests for sickle cells that will distinguish between the disease and



Fig. 1. Case 1. Photomicrograph showing the pooling of red blood cells in the sinusoids of the spleen obscuring the white cells. (Magnification 95 times.)

the trait. That test was developed by Sherman.[6] He has shown that a patient's blood taken without exposure to air and then put in a formalin saline solution will show from 30 to 60 per cent sickled cells in the disease and not more than 1 per cent in the trait. Blood taken soon after a hemolytic crisis may reveal a low percentage of sickled cells. Murphy and Shapiro[3] have observed that more sickled cells than normal cells are destroyed during a crisis so that more normal forms than sickled forms are circulating. Watson[8] also has observed that following a crisis fewer sickled cells are seen on a smear. Both postulate that crisis, when it occurs, is, in part, due to an increasing tendency of red blood cells to sickle on aging.

One of the simplest and most frequently used tests for sickle cells is the wet preparation. A drop of blood is placed on a cover slip; cresyl blue may be added. The cover slip, rimmed with paraffin is placed on a glass slide. The preparation is incubated at 37 C. for twenty-four hours. Sickling of the red blood cells depends on the presence of leukocytes, nucleated red blood cells or bacteria to utilize the oxygen. It is possible that with a paucity of such cells, sickling sometimes will not occur until after from forty-eight to seventy-two hours.

In the trait, sickle cells are not seen in blood smears. The oxygen tension necessary for in vitro sickling is 18 mm. of mercury which could not occur in vivo.

An ideal way to obtain blood is to constrict an arm, a finger or toe in an infant with a rubber band for five minutes before puncture, thereby obtaining in vivo deoxygenation and carbon dioxide saturation of the red blood cells.

Various tests are done which are useful but not practical for the ordinary small laboratory. Such examinations involve viewing red blood cells directly in a gas chamber in which oxygen or carbon dioxide can be introduced alternately.

Winsor and Burch[9] have devised a reliable test which applies certain principles seen in sickle cell anemia. Cells which sickle will not form roleaux and, hence, their sedimentation rate is much slower than normal cells. Since the degree of sickling is related to the carbon dioxide saturation they have taken samples of blood and divided them equally, using one portion with a high carbon dioxide content and areating the others, then determining simultaneously the rate of fall of the red blood cells in the two samples. The difference in the rate of fall of the two tests will be greater than 20 millimeters in an hour.

Singer and Robin[7] have devised another test which can be done more easily by the laboratory. It is especially valuable in those cases in which a quick diagnosis is desirable. Although mature



Fig. 2. Case 1. Photomicrograph demonstrating red blood cells in a relatively clear area of the spleen which show definite poikilocytosis. (Magnification 1,375 times.)

red blood cells do not consume oxygen, the presence of leukocytes, nucleated red blood cells and bacteria hasten sickling by their oxygen consumption. Singer and Robin hastened the process by using living organisms, i.e., by adding a drop of Bacillus subtilis culture to a drop of blood, sealing with paraffin and then incubating the preparation at 37 C. for five minutes. If the preparation shows no sickling, it is incubated for another ten minutes. If after this there is no sickling the authors say the results of the tests can be reported as negative.

Other laboratory tests to be done are reticulocyte

counts which in sickle cell anemia usually are elevated. The icterus index usually will be elevated. The red blood cell count varies from an extremely low to normal count. The cells have increased resistance to hypotonic saline solutions. On a blood smear erythroblasts can be seen as well as an occasional target cell.

The x-ray findings are similar to those in thalassemia with trabeculation of small bones and the "hair-on-end" appearance of the skull.

REPORT OF CASES

Case 1. G. B., aged 3½ years, Negro, male, had been delivered normally and spontaneously. The first admission, after delivery, at the St. Louis County Hospital was on April 11, 1949. At the age of 3 years he was seen in the clinic and admitted for study because of pallor and palpable spleen. His brother, who was four years old at that time, had been in the hospital previously for transfusion therapy for sickle cell anemia.

Physical Examination.—Temperature was 99 F., pulse 106, respirations 20. There was a grade II systolic murmur at the apex. The abdomen was protuberant. The liver was 1½ centimeters below the costal margin and the spleen was 4 centimeters below the costal margin. The red blood count was 2.62 million with a hemoglobin of 7 grams (45 per cent). The icterus index was 11 units. A twenty-four hour wet preparation for sickling was reported only as showing sickle cells. The percentage was not reported.

On April 13 the patient became listless and pale. He vomited three times. Respirations were 36. The temperature was 102 F. An impending crisis was thought

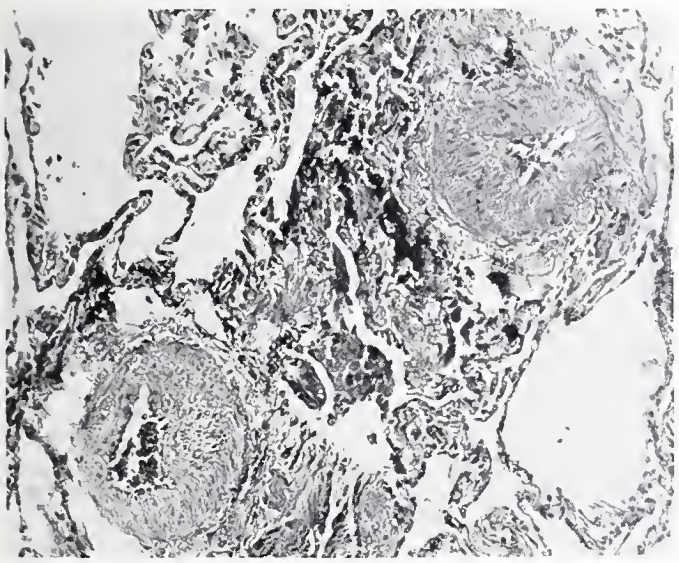


Fig. 3. Case 2. Photomicrograph of small vessels in the lung which show fibrosis and partial obliteration of their lumena. (Magnification 187 times.)

to be at hand. One hundred fifty cc. of whole blood was given. This was followed with 500 cc. of 5 per cent dextrose in saline. The temperature rose to 104 F. The next day the icterus index was 18 units. An x-ray of the chest was clear, but rales were heard in the right chest. The patient was given penicillin, although it was thought that the vascular system may have been overloaded by 110 cc. of blood and the 500 cc. of 2 per cent dextrose in water which had been administered that day. On April 14, 250 cc. of whole blood was given. April 19, 150 cc. was given. The red blood cell count reached four million. The patient was discharged on April 21, 1949.

The second admission was on September 9, 1949. In the outpatient department, the hemoglobin was 8.5 grams (54 per cent), and the patient entered the hospital for transfusions. The heart murmur was still heard but no abdominal organs were felt. Three hundred cc. of whole blood was given. The hemoglobin rose to 13 grams (83 per cent) on September 11 and the patient was discharged.

The final hospital admission was on February 13, 1950, but the patient lived only two hours after ad-

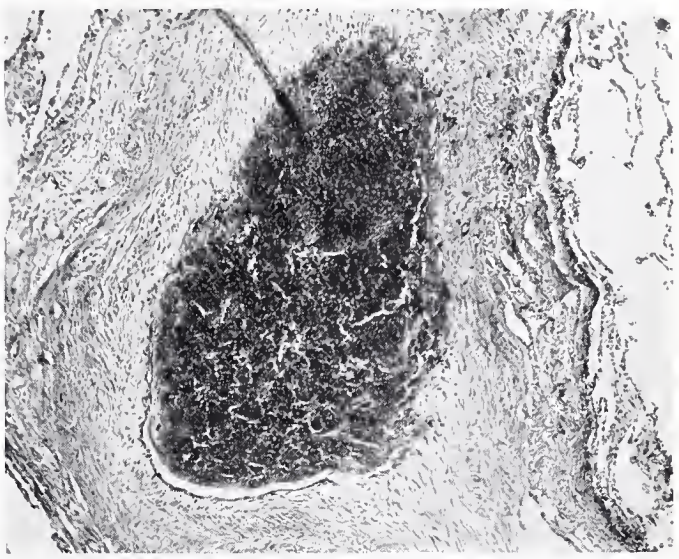


Fig. 4. Case 2. Photomicrograph of one of the medium sized arteries of the lung in which a recent thrombus is seen. (Magnification 95 times.)

mission. Since the previous admission, the child had done well until the day before admission when extreme pallor and fever appeared. The child was irritable and cried most of the night complaining of chest pain and cough. He became increasingly stuporous and was semicomatose on admission.

Physical Examination.—Temperature was 101.8 F., pulse 200 and respirations 60. The skin and mucous membranes were pale. The sclera were yellow. The pupils were dilated but equal. The heart tones were of poor quality. In the lungs were numerous rales. The liver was felt 3 centimeters below the costal margin and the spleen was large and firm. The splenic notch was felt. There was a slight generalized enlargement of the lymph nodes.

A blood culture was taken but no growth occurred. Streptococcus viridans and Staphylococci were recovered from a throat culture. Nonprotein nitrogen was 34 mg. per cent, chlorides were 602 mg. per cent and the CO_2 combining power was 27 vol. per cent. The child was given oxygen and penicillin. Death occurred before transfusions could be started.

Autopsy (General Description).—The patient was a well developed, well nourished Negro boy. The skin was pale. The sclera were pale with a faint icteric tint. The remainder of the external examination was not significant.

The body was opened by a "Y"-shaped incision. The muscles, body tissues and organs were pale. The blood was thin and watery. The lungs were pink-red in the dependent portions and subcrepitant. Forty and 50 cubic centimeters of serosanguineous fluid, respectively, were found in the pericardial and the peritoneal cavities. The spleen was large, weighing 460

grams. The liver weighed 570 grams. The color of the spleen was dark purplish-red and the cut surface was smooth.

On the inferior medial aspect of the left temporal lobe of the brain there was a thin-walled cyst containing clear fluid. This measured 4 centimeters in diameter. There was a definite contrast in the gray and white matter. The cortex of the left temporal lobe was present throughout, but was crowded at the region of the cyst. The cyst was in the leptomeninges outside of the brain tissue.

Microscopic Description.—There was intense congestion of the vessels of the alveolar walls of the lungs, the sinusoids of the liver and of intrinsic renal vessels.

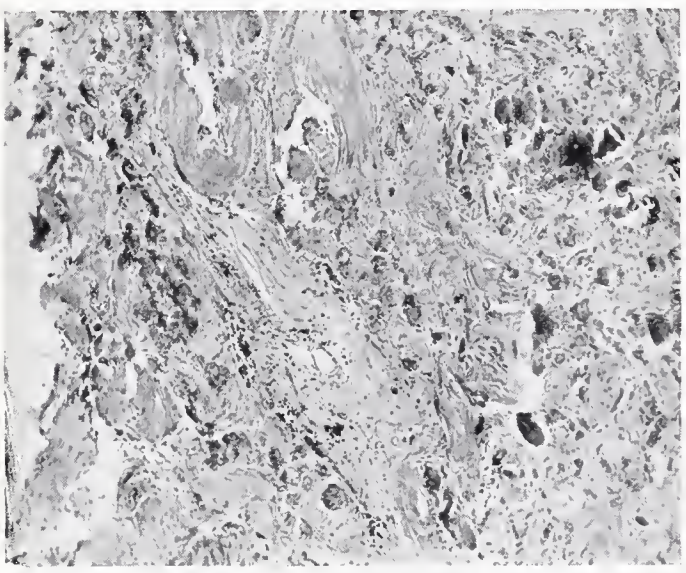


Fig. 5 Case 2. Photomicrograph which is from a representative section of the spleen which has undergone fibrosis. (Magnification 95 times.)

The red blood cells created dense lakes about the malphighian bodies (figure 1). In these areas the walls of the sinusoids were obscured. At the periphery of the areas of packed blood cells, individual cells were sickled (figure 2).

The rib bone marrow showed erythrocytic hyperplasia.

Case 2. C. B., aged 59 years, Negro, male, was first admitted to the St. Louis County Hospital on December 12, 1949. The complaints were shortness of breath for one year and precordial pain for three weeks before entry. This pain was aggravated by deep breathing and exercise and was relieved by rest. Weight loss of twenty pounds had occurred during the previous year. In the three weeks before admission there were attacks of nausea and vomiting temporarily, unrelated to the chest pain. On the day before admission, he had vomited three times. He also complained of nocturia two times a night.

Physical Examination.—Blood pressure was 135/75, pulse 80, respirations 20, temperature 99 F. The patient appeared in no acute distress. The point of maximum impulse of the heartbeat was at the fifth interspace 8.5 centimeters from the midsternal line. There was a grade II systolic murmur at the fourth interspace. The liver was one and a half centimeters below the costal margin. The spleen was not felt. The prostate was moderately enlarged. Laboratory work was reported showing a sedimentation rate of 4 millimeters in the first hour. The chlorides were 602 mg. per cent; nonprotein nitrogen was 30 mg. per cent. The hemoglobin was 13 grams (83 per cent). The white blood count was 7,500. Urinalysis showed 1 plus albumin with three white blood cells per high power field. X-ray showed a tenting of the left diaphragm thought to be due to an old pleurisy. An electrocardiogram suggested posterior myocardial damage. The patient was discharged on December 22, 1949.

The final admission was on February 6, 1950. Since the previous discharge, the patient had been treated for arteriosclerotic heart disease with an anginal syndrome. No relief from these symptoms was afforded by nitroglycerin. Vague abdominal discomfort had appeared since the last admission. Nausea and vomiting continued after digitalis therapy had been instituted.

Physical Examination.—Blood pressure was 120/92, pulse 80, respirations 18, temperature 98 F. The point of maximum impulse of the heart was 9.5 centimeters from the midsternal line. The rhythm was regular, the sounds were of good quality and no murmurs were heard. The liver edge was barely palpable. An electrocardiogram showed no appreciable change since the previous admission. The venous pressure was 280 millimeters of saline. An attempt to determine the circulation time using MgSo4 failed to produce an end point. The sedimentation rate was 2 millimeters in the first hour. The icterus index was 20 units. The cephalin cholesterol flocculation was negative in forty-eight hours. The prothrombin time was 75.6 per cent of normal. The red blood cell count was 3.66 million and the hemoglobin was 10.5 grams (67 per cent). The hemotocrit was 30 per cent. There was marked anisocytosis and poikilocytosis of the cells on the smear. A twenty-four hour wet preparation showed 40 per cent sickled cells. The Sherman test for sickled cells was 0.8 per cent. The mean corpuscular volume was 74 cubic microns, the mean corpuscular hemoglobin concentration was 26 micrograms. The mean corpuscular hemoglobin concentration was 35 per cent.

On February 11, the patient complained of a headache and shortness of breath, relieved by sitting. The liver edge was 5 centimeters below the costal margin and slightly tender. The short grade II systolic murmur was again heard. There was no pedal edema but digitalization was advised because of the enlarged liver, dyspnea and high venous pressure. On February 14 he became exceptionally dyspneic. The nail beds were cyanotic. There were numerous rales heard throughout the lung fields. The pulse was 110 a minute. At noon he became unconscious with gasping respirations, developed extrasystoles and soon expired.

Autopsy (General Description).—The patient was a well developed, well nourished Negro man. There was an increased anterior-posterior diameter to the chest.

Gross Description.—The body was opened by a "Y" shaped incision. The lungs were well aerated and were bright pink. The heart was hypertrophied and dilated, weighing 450 grams. The greatest enlargement involved the right ventricle. The circumference of the tricuspid ring was 130 millimeters, of the pulmonic ring 80 millimeters, of the mitral ring 95 millimeters and of the aortic ring 65 millimeters. The thickness of the right ventricle was 8 millimeters and that of the left ventricle 15 millimeters. Limited to the epicardium were several irregular areas of focal fibrosis. The coronary arteries were patent with no sclerosis. The spleen was a small nubbin of tissue weighing 2.8 grams. It was hard and was brown in color. The liver was congested. On the cut surfaces of the kidneys the congested glomeruli stood out as small red elevated dots.

Microscopic Description.—Sections of heart musele showed some variation in nuclear size, shape and staining properties consistent with hypertrophy of the fibers.

The sections from all lobes of the lungs showed that the lumena of all small and medium sized arteries were nearly obliterated by fibrous thickening of the intima (figure 3). There were some vessels with obliterated lumena and others with only small elliptical channels. There were some vessels containing organizing thrombi (figure 4). The capillaries of the alveolar walls were congested and the red blood cells within showed marked poikilocytosis. These cells were crescent or sickled in shape.

There was congestion of the sinusoids of the liver with sickled cells and central necrosis. The spleen was completely converted to dense fibrous tissue with numerous Gamna-Gandy bodies (figure 5). None of the normal splenic pulp persisted. Lymphocytes and an occasional giant cell were seen. Histiocytes containing a brown granular pigment were seen.

The capillaries of the tufts of the glomeruli and of the kidney parenchyma were intensely congested. They were packed with sickle cells (figure 6). An occasional hyalinized glomerulus and an occasional hyaline cast were seen. There were a few small areas of scarring with slight lymphocytic infiltration.

Sections of stomach, pancreas and prostate showed congested vessels which were packed with sickled cells. The vertebral bone marrow showed increased erythropoietic activity.

DISCUSSION AND SUMMARY

Two proven cases of sickle cell anemia with necropsy findings are reported. One is in a child and the other is in an adult. These two cases serve to demonstrate the extremes of organ changes produced by the disease.

History.—In the child the history of fever, pallor, chest pain and cough was elicited; while in the adult there was a history of dyspnea, precordial pain and vague abdominal complaints, nausea and vomiting.

Physical Findings.—The child demonstrated icteric sclera, a hemic murmur, a large palpable liver and spleen. In the adult a hemic heart murmur was heard; the liver was palpable but the spleen was not.

Laboratory Findings.—In the child there was anemia on the first two admissions. Death occurred on the final admission before a count was obtained. A slight increase in the icterus index was demonstrated on the first admission. No subsequent tests were done. A twenty-four hour wet preparation for sickling showed sickle cells. In the adult there was a mild anemia. The icterus index was elevated. The sedimentation test showed a slow rate of fall for the red blood cells. A Sherman test was reported as showing 0.8 per cent sickled cells. A twenty-four hour wet preparation for sickling showed 40 per cent sickled cells. It is probable that this patient had had a recent hemolytic episode which reduced the percentage of circulating sickled cells found.

Course.—The diagnosis of sickle cell anemia on the child was made six months before his death. During this period of time he was given whole blood transfusions on two occasions for his anemia. He died in crisis on the last admission before therapy could be given. The adult gave no history prior to one year before the first admission to the hospital. From that time to the final admission he was treated for a cardiac condition. Although sickle cell anemia was a tentative diagnosis during the final admission, it was not definitely established until a postmortem examination was done.

Autopsy Findings.—In the child all organs showed congestion with sickle cells. The spleen was unusually large. Fibrosis of organs, which takes place after years of repeated hemolytic episodes, was not present in the child as was demonstrated in the adult. In the older patient the capillaries of the alveoli, the vessels of the liver, stomach, pancreas, kidneys and prostate showed congestion. The spleen was reduced to a small nodule of fibrous tissue. Some vessels of the lungs showed organizing thrombi within them and in others the lumena showed fibrosis.

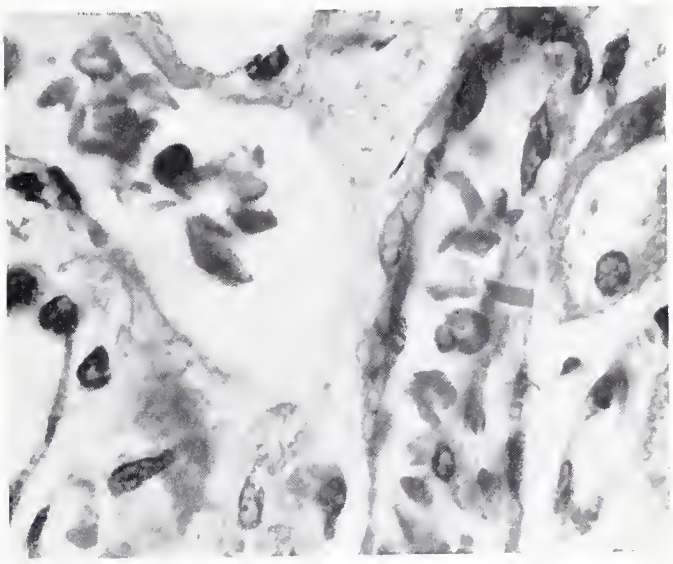


Fig.6. Case 2. Photomicrograph illustrating vessels of the kidney in which there are few cells so that the poikilocytosis of individual cells can be seen. (Magnification 1,375 times.)

St. Louis County Hospital.

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PRESIDENT'S PAGE

Before another President's Page appears, another Annual Session will have become history; another President will present the President's Page. It is sincerely hoped that a large number of members will take part in making the history of this, the 93rd Annual Session, April 22 through 25, in Kansas City, outstanding.



An excellent program, color television and the well known hospitality of Jackson County promise an outstanding session. There cannot but be one note of sadness in the session, however. Our immediate Past President, Wallas Smith, M.D., Springfield, will be sadly missed for there was no member, officer or not, who gave more or got more out of an Annual Session. His guidance will be missed but his influence still will remain. Wallis Smith was my friend; he was a friend of organized medicine.

I know how he felt about his professional brothers in Missouri. He enjoyed every minute of his life to the fullest. He was never happier than when he was attending a medical meeting. He loved to visit and chat with his friends. He always attended the Annual Sessions and when I saw him just before he left on his vacation trip, his farewell was "See you at the State Meeting in Kansas City, April 22."



Editorials

ANNUAL SESSION

The Ninety-third Annual Session, to be held in Kansas City, April 22, 23, 24 and 25, promises to be as successful a meeting as the Centennial Session held in 1950. The omission of sessions during the Civil War and in 1945 during World War II made the one-hundredth anniversary of the Association coincide with the Ninety-second Annual Session.

Color television will be used at the 1951 Session, the first showing of color television in Kansas City. To members who attended the last Annual Session, the value of this means of scientific presentation is well known. For those who will see it for the first time at the Ninety-third Annual Session, much is in store for them. An excellent program of surgery and medical clinics has been planned by Kansas City members of the Association. Operations performed and clinics held at Kansas City General Hospital will be viewed in the Grand Foyer of the Auditorium.

Each session will open with television. Following an intermission, to give members opportunity to view the technical and scientific exhibits, formal presentations will be given by out of state speakers who have been chosen for their ability to give practical information in their various fields. The scope of the program is rather broad so that each member, while gaining some from each lecture, will find those things that especially interest him.

The President-elect, C. Edgar Virden, M.D., Kansas City, will be installed at the Annual Banquet in Honor of Past Presidents at which W. A. Bloom, M.D., Fayette, President, will preside. The speaker at the banquet will be Melvin A. Casberg, M.D., St. Louis, Dean of St. Louis University School of Medicine. Dr. Casberg has spent much time in the Far East and his subject will be "The United States and the Far East."

"Civil Defense; Special Emphasis on Its Medical Aspects," will be presented by Curtis H. Lohr, M.D., St. Louis, at a session on Sunday evening, April 22, in the Ball Room of Hotel President.

The House of Delegates will convene for its first session on Sunday, April 22, at 2:00 p. m. in Room 600, Municipal Auditorium. The scientific session will begin on Monday morning.

A schedule of the session, the program, the technical and scientific exhibits and a list of delegates appears in this issue of THE JOURNAL, as does information on hotel reservations for the session.

GROWTH OF POPULATION IN THE LAST CENTURY

The population of the United States is six and one half times that of a century ago, having increased from 23,000,000 in 1850 to 151,000,000 in 1950, according to the *Statistical Bulletin* of the Metropolitan Life Insurance Company. If the rate of national growth had been constant throughout this period, the number would have increased by 20.6 per cent every decade. The general tendency has been for the rate of growth to slow down. Between 1850 and 1900 the average decennial increase was 26.8 per cent; since 1900 it has been 14.7 per cent. Even so, the population has doubled in the last fifty years.

The decrease in the rate of growth reflects primarily the long term downward trend in the birth rate until past the middle 1930's and, to a lesser extent, the sharp curbs imposed on immigration in the early 1920's. In the last decade, the upswing in the birth rate and the partial relaxation of immigration restrictions have accelerated population growth. The census of 1950 showed a population increase of 14.5 per cent for the last decade, against a rise of only 7.2 per cent for the decade before. However, the rate of population growth in the last ten years was slightly below the average for the half century since 1900. The rate of increase during the decade of World War II was at about the level as for the decade of World War I.

The rates of increase have varied widely from one region of the country to another. The West has experienced the most rapid rate of growth, reflecting the large scale westward migration which began in the middle of the nineteenth century and which is still continuing.

The Midwest experienced quite different population trends in the two fifty year periods. In 1850 to 1900, the West North Central region, with a decennial increase of almost 64 per cent ranked just below the Far Western states in the rate of population growth. In the last half century, however, this midwestern region had a smaller rate of increase than any other, namely, 6.3 per cent a decade. Some of the West North Central states have lost population in the recent past, North and South Dakota, Nebraska and Kansas.

The increase in Missouri from 1940 to 1950 was 4.5 per cent. The per cent increase for Missouri in ten year periods beginning with 1850 has been: 1850-1860, 73.3 per cent; 1860-1870, 45.6; 1870-1880, 26.0; 1880-1890, 23.6; 1890-1900, 16.0; 1900-1910, 6.0; 1910-1920, 3.4; 1920-1930, 6.6; 1930-1940, 4.3; 1940-1950, 4.5.

The Eastern and the Southern states, the first areas to be settled in this country, grew relatively slowly during both fifty year periods.

Annual Session Program
(See page 313)

Hotel Reservations
(See page 339)

Organization and Economics

NEWS NOTES

John R. Lawrence, M.D., Marshall, addressed the Marshall Lions Club on "Heart" on February 5.

Buford G. Hamilton, M.D., Jefferson City, Director, Division of Health, was a guest speaker at a meeting of the Southwest Missouri Practical Nurses' Association in Joplin on February 5. Dr. Hamilton spoke on "Nurse-Patient Relationship."

Herbert Rinkel, M.D., and Ellsworth H. Trowbridge, Jr., M.D., Kansas City, were guest speakers on March 14 at a meeting of the Health Institute of the Health Education Section of the Health Department of Kansas City. Dr. Rinkel spoke on "Allergies" and Dr. Trowbridge on "Headaches."

Elmer L. Henderson, M.D., Louisville, Ky., President of the American Medical Association, has been elected president of the American Medical Education Foundation.

Claude E. Bohrer, M.D., West Plains, addressed the Carmical Parent Teachers Association on January 19 on "Protection by Immunization."

Richard Aiken, M.D., Marshall, addressed the Marshall Optimists Club on February 6 and spoke on "The Human Heart and Its Diseases."

T. Reid Maxson, M.D., Warrensburg, addressed a meeting of the American Association of University Women at Warrensburg on January 15. He spoke on "America Meets the Challenge of World Leadership in Medicine."

Willis Hall, M.D., and James A. Dickson, M.D., St. Louis, celebrated the seventieth anniversary of their graduation in medicine on March 3.

The second annual Dr. F. G. Thompson, Sr., lecture will be presented by John H. Garlock, M.D., New York, at the Clinic Building, St. Joseph, on May 10. Dr. Garlock will speak on "Surgery of the Esophagus."

The Kansas City Southwest Clinical Society will present Merit Awards again this year for original work of residents and interns in this area. The winner of the first award will receive $500.00 and will be a guest speaker at the Annual Clinical Conference. Second awards will be $100.00 and $50.00. Information may be obtained from the Kansas City Southwest Clinical Society, 630 Shukert Building, Kansas City.

The consulting staff of the Ellis Fischel State Cancer Hospital, Columbia, will meet for a scientific program at the Hospital on April 22. Louis Jorstad, M.D., St. Louis, will speak on "Tumors of the Mandible"; Paul Schaffer, Kansas City, "Carcinoma of the Lung," and Drs. John Modlin, Howard Walker and Jerry Allen, Columbia, will discuss "Surgical Management of Cancer of the Skin."

Malcolm T. MacEachern, M.D., formerly director of the American College of Surgeons, has been appointed director of professional relations of the American Hospital Association.

Robert E. Bruner, M.D., Kansas City, will address the General Practitioners Study Club of Greater St. Louis on April 18 on "Early Diagnosis and Treatment of Cerebral Palsy."

MUSINGS OF THE FIELD SECRETARY

Why retire at 65, or at any other age? Last September 4, during the Annual Linn County Hoof and Horn Club Rodeo, an old folks' riding contest was staged. The following is quoted from the September 5 issue of *The Brookfield Daily News*: "The crowd was liberal with applause when Dr. W. B. Lucas, 96 year old Mendon physician, climbed aboard his horse and put on an accomplished riding performance. There was no doubt as to his winning this special part of the show. Dr. Lucas also drove his car to Brookfield to attend the rodeo." In addition to such activities, Dr. Lucas continues his practice of medicine in Mendon.

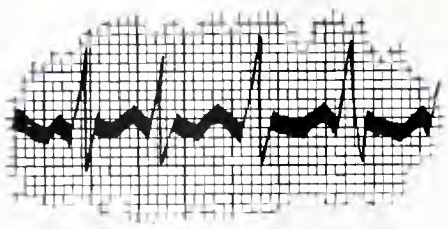
The Sixth Annual National Rural Health Conference, sponsored by the Committee on Rural Health of the American Medical Association in cooperation with various national farm organizations, held February 23 and 24 at the Peabody Hotel, Memphis, Tenn., presented many examples of local communities where the theme "Why Wait—Let's Do It Ourselves," has and is being carried out. For instance, the Clinton County (Ohio) Health Council has completed an extensive health information survey of the entire county. More than 400 citizens of the county called at the homes of all county residents with a comprehensive health questionnaire. The composite information gathered is serving as the basis for health improvement programs in the county. The health problems under consideration are not theoretical but are those uncovered by the people themselves and much interest has been aroused.

Outside of contemplated A bomb areas it is questionable if many people are thinking a great deal about civil defense. Probably they are figuring that the chances of a bomb being dropped in their immediate vicinity is practically nil. Therefore, why

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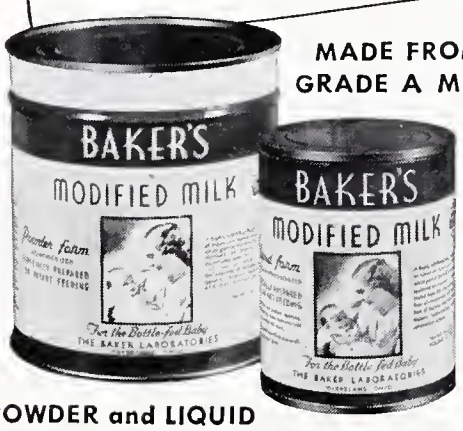
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be much concerned. Is there not great need to point out effectively to them the huge responsibilities coming their way in case certain industrial areas are bombed?

"Springfield, Missouri—Medicine loses a giant." Those were the opening words on Alex Drier's 7:00 a. m. news broadcast, Monday, March 5, 1951. His elaboration on those impressive words told of the death of Wallis Smith, M.D., and so ably described the outstanding attributes which had endeared Dr. Wallis to so many.

DEATHS

(Correction: The March issue carried a death notice on the wrong Dr. Etzenhouser. Following is the correct death notice.)

Etzenhouser, Merrill W., M.D., Independence, a graduate of the University of Kansas School of Medicine, 1937; member of the Jackson County Medical Society; aged 39; died January 16.

Haskell, Claude E., M.D., Tarkio, a graduate of the Keokuk Medical College, 1904; member of the Nodaway-Atchison-Gentry-Worth County Medical Society; aged 74; died January 26.

Latham, Logan L., M.D., California, a graduate of Barnes Medical College, St. Louis, 1905; member and past president of the Moniteau County Medical Society; aged 69; died February 11.

Jordan, James E., M.D., Columbia, a graduate of University of Missouri School of Medicine, 1895; Affiliate Fellow of the American Medical Association; honor member of the Boone County Medical Society; aged 78; died February 26.

Hayward, John D., M.D., Clayton, a graduate of Barnes Medical College, 1906; Affiliate Fellow of the American Medical Association; honor member and past president of the St. Louis County Medical Society; aged 73; died March 3.

Smith, W. Wallis, M.D., Springfield, a graduate of Rush Medical College, Chicago, 1912; Fellow of the American Medical Association; Past President of the Missouri State Medical Association; Councilor of the Eighth Councilor District from 1943 until elected President-Elect; member and past president of the Greene County Medical Society; aged 64; died March 4.

Gronoway, Terrence P., M.D., Macon, a graduate of Washington University School of Medicine, 1910; Fellow of the American Medical Association; member and past president of the Chariton-Macon-Monroe-Randolph County Medical Society; aged 64; died March 4.

NEW MEMBERS

Bopp, Henry W., Jr., M.D., St. Louis.
Bruce, Helen L., M.D., St. Louis.
Crouch, Wm. H., Jr., M.D., Jefferson City.
Etheredge, Maude Lee, M.D., Columbia.
Forster, A. F., M.D., St. Louis.
Hanser, Otto C., M.D., St. Louis.
Kaiser, Clarence D., M.D., Hayti.
Keely, Thomas J., Jr., M.D., St. Louis.
Madison, Waite H., M.D., Marshall.
Mead, Sedgwick, M.D., St. Louis.
Mosco, James A., M.D., Clayton.
Ogura, Joseph H., M.D., St. Louis.
Pennoyer, James, M.D., St. Louis.
Petty, Wallace S., M.D., Macon.
Smith, David E., M.D., St. Louis.
Shevlin, Charles F., M.D., St. Joseph.
Stock, Albert E., M.D., St. Louis.
Walker, Ambrose T., M.D., Mammoth Spring, Arkansas.
Warner, George K., M.D., St. Louis.
Winkler, L. F., M.D., St. Louis.

MISSOURI STATE MEDICAL ASSOCIATION

The 93rd Annual Session of the Missouri State Medical Association will be held at the Municipal Auditorium, Kansas City, April 22, 23, 24 and 25, 1951.

TIME AND PLACE OF MEETINGS

Sunday, April 22

12:30 p. m. Registration. Arena, Municipal Auditorium.
2:00 p. m. House of Delegates. Room 600, Municipal Auditorium.
6:30 p. m. Dinner for Presidents, Secretaries and Editors of County Medical Societies. Aztec Room, Hotel President.
8:00 p. m. Civil Defense: Special Emphasis on Its Medical Aspects, Curtis H. Lohr, M.D., St. Louis. Ball Room, Hotel President.

Monday, April 23

8:00 a. m. Registration. Arena, Municipal Auditorium.
8:30 a. m. Color Television. Grand Foyer, Municipal Auditorium.
11:00 a. m. Scientific Session. Little Theater, Municipal Auditorium.
1:30 p. m. Color Television. Grand Foyer, Municipal Auditorium.
3:30 p. m. Scientific Session. Little Theater, Municipal Auditorium.
4:00 p. m. House of Delegates. Room 600, Municipal Auditorium.
7:30 p. m. Annual Banquet in Honor of Past Presidents. Ball Room, Hotel President.

Tuesday, April 24

8:00 a. m. Registration. Arena, Municipal Auditorium.
8:30 a. m. Color Television. Grand Foyer, Municipal Auditorium.

11:00 a. m. Scientific Session. Little Theater, Municipal Auditorium.
1:30 p. m. Color Television. Grand Foyer, Municipal Auditorium.
3:30 p. m. Scientific Session. Little Theater, Municipal Auditorium.

Wednesday, April 25

8:00 a. m. Registration. Arena, Municipal Auditorium.
8:30 a. m. Color Television. Grand Foyer, Municipal Auditorium.
11:00 a. m. Scientific Session. Little Theater, Municipal Auditorium.
1:30 p. m. Color Television. Grand Foyer, Municipal Auditorium.
2:00 p. m. House of Delegates. Room 600, Municipal Auditorium.

SCIENTIFIC PROGRAM

Monday, April 23, 1951, 8:30 a. m.

8:30 a. m. Color Television: Surgical. Grand Foyer, Municipal Auditorium.
Thyroidectomy, Claude J. Hunt, M.D., and Walter Cummins, M.D., Kansas City.
Herniorrhaphy, Ralph R. Coffey, M.D., Kansas City, and Residents of Kansas City General Hospital.
Pilonidal Cyst, Mark M. Marks, M.D., Kansas City, and Residents of Kansas City General Hospital.

10:30 a. m. Intermission to View Exhibits.

Scientific Session, Little Theater, Municipal Auditorium

11:00 a. m. Arthritis, Comments on Diagnostic Problems and New Developments in Therapy, Edward F. Rosenberg, M.D., Chicago.

11:30 a. m. Rh and Hr Sensitization in Obstetric Practice, Woodard D. Beacham, M.D., New Orleans.

Since the discovery of the Rh factor in 1940 much has been written about it in medical and lay publications. It is now common knowledge that Rh-negative females should not be given Rh-positive blood. The therapy of Rh and Hr immunized women is not so clearly understood. With the cooperation of Dr. J. W. Davenport, Serologist at the Southern Baptist Hospital, evaluation of the problem as applied to present day obstetric practice will be presented.

12:00 noon. The Physician and Oral Health in Children, John A. Bigler, M.D., Chicago.

Many articles on oral health in children have appeared in dental journals with relatively few in the more commonly read pediatric literature.

By various surveys it has been shown that 92 per cent of the population require dental care. It has also been shown that from 50 to 60 per cent of children under 5 years of age require active dental care. The problem is so great that the dental profession alone cannot be expected to take care of this great load. Because of this the medical profession must become interested in the problem. To do so, they must know the accepted theories of caries initiation as well as the principles of oral health and a realization of what good dental repair should consist.

This paper reviews the present accepted methods of the control and prevention of dental caries as well as evaluates the value of dentifrices.

1:30 p. m. Color Television: Medical. Grand Foyer, Municipal Auditorium.
Fracture Clinic, Rex L. Diveley, M.D., and Richard H. Kiene, M.D., Kansas City.
Arthritis Clinic, C. S. Gillmor, M.D.; James A. Jarvis, M.D., and Garrett Pipkin, M.D., Kansas City.
Peripheral Vascular Clinic, F. Stanley Morest, M.D.; J. D. Bennett, M.D., Kansas City, and Residents of Kansas City General Hospital.

3:00 p. m. Intermission to View Exhibits.

Scientific Session, Little Theater, Municipal Auditorium

3:30 p. m. Cardiac Surgery From the Standpoint of the General Practitioner, C. Rollins Hanlon, M.D., St. Louis.

4:00 p. m. Rheumatoid Arthritis, Present Status of Hormone Therapy, Edward F. Rosenberg, M.D., Chicago.

4:30 p. m. Ectopic Pregnancy, Woodard D. Beacham, M.D., Chicago.

Although the cardinal signs of eccysis have been known for many years and the value of early diagnosis universally appreciated, the condition continues to be one of the major causes of maternal death. In modern times the typical case of ruptured tubal pregnancy receives the benefits of prompt treatment including operation and blood replacement. Methods employed in our locality to make a diagnosis in the atypical or masquerading variety will be evaluated. Data derived from a study of the New Orleans Charity Hospital series of more than 1,200 cases of ectopic gestation will be presented.

7:30 p. m. Annual Banquet in Honor of Past Presidents, Ball Room, Hotel President.

The United States and the Far East, Melvin A. Casberg, M.D., St. Louis.

Tuesday, April 24, 1951, 8:30 a. m.

8:30 a. m. Color Television: Surgical. Grand Foyer, Municipal Auditorium.

Perineorrhaphy, Harold L. Gainey, M.D.; James E. Keeler, M.D., Kansas City, and Residents of Kansas City General Hospital.

Total Hysterectomy, Kenneth Cox, M.D., and W. C. Mixson, M.D., Kansas City.

10:30 a. m. Intermission to View Exhibits.

Scientific Session, Little Theater, Municipal Auditorium

11:00 a. m. The Use of Diuretics in Congestive Heart Failure, G. E. Burch, M.D., New Orleans.

11:30 a. m. Congenital Malformations Remedial During Early Infancy, John A Bigler, M.D., Chicago.

A description of the symptoms and physical findings for the early recognition of congenital anomalies of the mouth and gastrointestinal tract as seen in the neonatal period will be presented. The importance of early recognition is stressed so that the correct treatment can be given early to reduce neonatal mortality.

12:00 noon. The Caprices of Sarcoidosis, Andrew L. Banyai, M.D., Milwaukee.

In the *Annals of Clinical Medicine* sarcoidosis is being recorded with increasing frequency. The reason for this is a prevalent better diagnostic consciousness rather than an increase in the incidence of the disease. Sarcoidosis is one of the most elusive and protean clinical entities. Common manifestations of this disease have been recorded under many technical terms.

Bedside examinations as well as postmortem studies show that sarcoidosis may involve virtually every part of the body. Typical lesions may be localized in one site or an organ or system or the disease may manifest itself in simultaneous involvement of various systems of the body.

A great deal of time and effort have been devoted to the clarification of the etiology of sarcoidosis. Even so, there is no consensus applicable to the origin of this disease. The incidence of this disease is the highest in young adults and persons of middle age. It rarely is seen in children.

Diagnosis is based on the combined assaying of history, physical and x-ray findings and laboratory data. In ruling out other diseases with similar manifestations, one should avail himself of various specific skin tests, examination of the sputum and fasting gastric contents for pathogenic micro-organisms, blood culture, agglutination and complement fixation tests, differential and total blood cell counts and other diagnostic methods.

The various methods and drugs advocated for the management of sarcoidosis are an expression of the fact that there is no uniformly potent means for the treatment of this condition. Studies are in progress for the purpose of evaluating recently discovered nonspecific physiologic factors.

1:30 p. m. Color Television: Medical. Grand Foyer, Municipal Auditorium.

Cardiac Clinic, A. Graham Asher, M.D.; P. A. G. Johnson, M.D., and Philip L. Byers, M.D., Kansas City.

Tumor Clinic, E. Kip Robinson, M.D.; Victor B. Buhler, M.D.; F. J. McCoy, M.D., and Edward H. Klein, M.D., Kansas City.

Dermatology, Robert J. Murphy, M.D., and David R. Morgan, M.D., Kansas City.



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HERE'S a short-acting sedative in liquid form that patients old and young can take without difficulty. It's the new, improved NEMBUTAL Elixir—tops in taste, odor, color and miscibility. • The new NEMBUTAL Elixir is not a delectable treat, of course, but considering that it contains a bitter-tasting drug, it is palatable indeed. Use of SUCARYL® Sodium, Abbott's non-caloric, heat-stable sweetener, in place of much of the sugar helped to improve the taste. • The new NEMBUTAL Elixir is much less viscous than the old, making it readily miscible with other medication. It also has a wide range of compatibility, including a number of other drugs, infant's formula and whole milk, and it remains stable even when heated. • The new NEMBUTAL Elixir is available in 1-pint shelf-saving and 1-gallon bottles, each teaspoonful representing 15 mg. (¼ gr.) of short-acting NEMBUTAL Sodium. Other products in the NEMBUTAL line include capsules, suppositories, tablets, solutions and sterile powder for solutions. Handy small-dosage sizes simplify administration. Abbott

REMEMBER: In equal oral doses, no other barbiturate combines QUICKER, BRIEFER, MORE PROFOUND EFFECT than NEMBUTAL.

3:00 p. m. Intermission to View Exhibits.

3:30 p. m. Symposium on Hematology. Little Theater, Municipal Auditorium.
Classification of Anemias, Roland P. Ladenson, M.D., Columbia.
Classification of Leukemias, Jack H. Hill, M.D., Kansas City.
Recent Trends in Treatment, Edward H. Reinhard, M.D., St. Louis.

Wednesday, April 25, 1951, 8:30 a. m.

8:30 a. m. Color Television: Surgical. Grand Foyer, Municipal Auditorium.
Biopsy of Breast With Discussion of Diagnosis and Technic, Carl B. Schutz, M.D., and Walton C. Ingham, M.D., Kansas City.
Cholecystectomy, V. T. Williams, M.D., Kansas City, and Residents of Kansas City General Hospital.
Hemorrhoidectomy and Fissurectomy, Frederick Campbell, M.D., and William C. Schaerrer, M.D., Kansas City.

10:30 a. m. Intermission to View Exhibits.

Scientific Session, Little Theater, Municipal Auditorium

11:00 a. m. Modern Treatment of Cough, Andrew L. Banyai, M.D., Milwaukee.

Competent management of cough is impossible without a clear understanding of its mechanism and the physiologic processes which are responsible for the natural self-cleansing capacity of the lung and accurately assaying the origin of this symptom.

The most frequent sources of cough are diseases of the lung, throat or heart. In addition there are extrapulmonary conditions. The act of coughing consists of inspiratory, compressive and expulsive phases. If successful drainage under the influence of cough is accomplished, one considers the cough useful, adequate or beneficial. When cough is not productive, it is customarily designated as unproductive or useless.

Thorough examination of the patient and an evaluation of the competency of cough are indispensable in the treatment of cough. There are a number of useful methods and drugs by means of which cough can be managed effectively. They can be divided in two large groups: (1) those which are capable of enhancing the natural functional self-cleansing capacity of the lung, and (2) those which are classified as cough sedatives. In a number of instances they are used in combination. Their proper selection and timing are the key to beneficial results.

11:30 a. m. Clinical Applications of Venous Pressure Measurements, G. E. Burch, M.D., New Orleans.

12:00 noon. Modern Concepts in the Diagnosis and Management of Minimal Chest Disease, Paul W. Schafer, M.D., Kansas City, Kansas.

1:30 p. m. Color Television: Medical. Grand Foyer, Municipal Auditorium.
Pediatric Clinic, Edwin H. Schorer, M.D.; Frank Hogue, M.D.; Harry Gilkey, M.D., and C. W. Seely, M.D., Kansas City.
Technic of the Neurologic Examination, F. A. Carmichael, M.D., and Robert W. Forsythe, M.D., Kansas City.
Disorders of the Back, Garrett Pipkin, M.D., Kansas City, and Residents of Kansas City General Hospital.
Disorders of the Feet, N. S. Pickard, M.D., Kansas City, and Residents of Kansas City General Hospital.

SCIENTIFIC EXHIBITS

Municipal Auditorium, Kansas City

An Introduction to Fractures, The Committee on Fractures of the Missouri State Medical Association and the Missouri Regional Committee on Trauma of the American College of Surgeons.

Practical Points in Diagnosis and Treatment of Children's Diseases, Harry M. Gilkey, M.D., Kansas City.

Children's Diabetic Camp, Harry M. Gilkey, M.D., Kansas City.
Cancer of the Lung, Missouri Division, American Cancer Society.
Brain Registry of the American Academy for Cerebral Palsy, Robert E. Bruner, M.D., Kansas City.
Cancer Problems in Missouri, Ellis Fischel State Cancer Hospital, Columbia.
Rectal Diseases, Fred B. Campbell, M.D., Kansas City.
Bladder Tumors, Hjalmar E. Carlson, M.D.; Clarence Johnson, M.D., and Jack H. Hill, M.D., Kansas City.
Functional Disorders of the Adult Foot, Frank D. Dickson, M.D., and Rex L. Diveley, M.D., Kansas City.
Atomic Warfare and Its Medical Aspects, Carroll P. Hungate, M. D., Kansas City.
Ventriculography, Encephalography and Cerebral Angiography, Ira H. Lockwood, M.D.; Arthur B. Smith, M.D.; Vernon M. Lockard, M.D.; Samuel B. Chapman, M.D.; Frederick C. Wallingford, M.D., and John W. Walker, M.D., Kansas City.
Rehabilitation, Rehabilitation Institute, Kansas City.
Public Health, Missouri Division of Health, Buford G. Hamilton, M.D., Director.
Demonstration of Gross Pathology, Surgical and Postmortem Specimens, Western Section, Missouri Society of Pathologists.
New Technics and Procedures in Diagnosis by Laboratory Methods, Missouri Society of Medical Technologists.
Common Rheumatic Diseases, C. Stewart Gillmor, M.D., Kansas City.
Physical Therapy and Rehabilitation, Eastern Missouri Chapter, American Physical Therapy Association, St. Louis.
Blood Typing, Missouri Society of Medical Technologists.
Radioactive Diiodofluorescein in the Localization of Brain Tumors, G. E. Thoma, M.D., and R. D. Woolsey, M.D., St. Louis.
Plastic Surgical Reconstruction of Cleft Lip, James F. Dowd, M.D., St. Louis.
Diagnosis of Obscure Cardiovascular Lesions, Joseph Edwards, M.D., St. Louis.
Treatment of Carcinoma of the Thyroid, Willard Bartlett, M.D., and G. E. Thoma, M.D., St. Louis.
Clinical Observations on Results of Cauterization of the Postpartum Cervix, J. M. Singleton, M.D., and Floyd C. Atwell, M.D., Kansas City.

TECHNICAL EXHIBITS

Municipal Auditorium—Kansas City

W. B. Saunders, Philadelphia. Booth 5.

We invite all doctors attending the meeting to visit our exhibit where Mr. Seth L. Nelhinch is displaying a complete line of our books including Hyman's "Integrated Practice of Medicine," Human's (new) "Progress Volume," Conn's "1951 Current Therapy," Anson's "Atlas of Human Anatomy," Sodeman's "Pathologic Physiology," Sweet's "Thoracic Surgery," Colonna's "Regional Orthopedic Surgery," Jackson & Jackson's "Bronchoesophagology," Shanks' "Textbook of X-ray Diagnosis," Smith's "Plastic Surgery," Pullen's "Medical Diagnosis," Curtis' "Textbook of Gynecology," Friedberg's "Diseases of the Heart," Hollinshead's "Functional Anatomy of the Limbs and Back," Alvarez' "The Neuroses," Mitchell & Nelson's "Textbook of Pediatrics," Major's (new 4th edition) "Physical Diagnosis," American College of Surgeons' "Surgical Forum," and many other new books and new editions.

Schering Corporation, Bloomfield, N. J. Booth 6.

Gynetine, Schering's combination of estradiol and testosterone, available in oral and parenteral forms is displayed at the Schering Booth together with Methostan, Schering's brand of Methandriol, methylandrostenediol. Trimeton Lotion, and Trimeton Maleate Cream, two outstanding antihistamine preparations for topical application also are features along with Chlor-Trimeton Tablets and Chlor-Trimeton Maleate Syrup. Schering Representatives are present to welcome you and will be happy to answer inquiries concerning other products of our manufacture.

Lederle Laboratories Division, New York. Booth 7.

Representatives who are prepared to give the latest information on products of the Lederle Laboratories Division of American Cyanamid Company are at Booth 7 to extend a hearty welcome to physicians.

Vaisey-Bristol Shoe Company, Inc., Rochester, N. Y. Booth 9.

The Vaisey-Bristol Shoe Company exhibit features its Jumping Jack shoes. Jumping Jacks are the shoes designed especially for children 6 months to 4 years. The appearance is somewhat different from the conventional shoe as they feature a sole which continues up the back of the shoe. This gives the Jumping Jack a cylinder-rounded back which provides a straight line striking point for the heel and tends to make the foot go forward straight the same as a cylinder lying on its dies goes in a straight line when rolled. Jumping Jacks are also characterized by a flexibility allowing the foot to exercise but the sole is sufficiently heavy to give adequate protection against stones and other sharp objects. Wearing qualities are exceptional, the shoe usually being outgrown before being outworn.

PARKE, DAVIS & CO., DETROIT, MICH. BOOTH 10.

Medical Service Members of the Parke, Davis & Company Staff are in daily attendance at our Technical Exhibit for consultation and discussion of the various products listed in our Pharmaceutic, Antibiotic and Biologic Catalog. Important Specialties such as Chloromycetin, Penicillin S-R, Benadryl, Vitamins, Oxycel, Thrombin Topical, Influenza Virus Vaccine, and others are featured. You are most cordially invited to visit our Exhibit with the assurance that your personal interest will indeed be very much appreciated.

O'CONNELL BROS., INC., ST. LOUIS. BOOTH 12.

Rest, Relax or Read your newspaper in peace and comfort at the "booth by the side of the road." A rendezvous for "convention feet." Sit down and enjoy yourself and watch the parade go by; it's later than you think. Sure we sell drugs, but why bring that up. Bill and Joe O'Connell.

LUZIER'S, INC., KANSAS CITY. BOOTH 13.

Luzier's Fine Cosmetics and Perfumes, as advertised in the Missouri State Medical Journal are on exhibit in Booth 13. The Luzier formulas are selected to suit individual cosmetic requirements and preferences and may be modified to suit allergies. Luzier officials are in attendance to explain in detail the nature of this service.

CAMEL CIGARETTES, NEW YORK. BOOTH 14.

Camel Cigarettes are featuring color slides of background data from their newest research. After weekly examinations on the throats of hundreds of men and women smoking Camel Cigarettes exclusively for thirty days, throat specialists reported "Not one single case of throat irritation due to smoking Camels."

U. S. VITAMIN CORPORATION, NEW YORK. BOOTH 15.

See and taste for yourself the new and different sodium-free salt substitute—Co-Salt—which actually tastes like salt, looks like salt and sprinkles like salt—a great boon to your patients on restricted sodium intake. Exhibit also features original, complete lipotropic therapy—Methischol—a combination of five proven lipotropic agents: B_{12}, choline, methionine, inositol and liver extract. Therapeutically effective in the treatment of hypercholesterolemia as associated with atherosclerosis, coronary disease, obesity and various forms of liver disease, including liver cirrhosis and toxic hepatitis.

VARICK PHARMACAL COMPANY, NEW YORK. BOOTH 16.

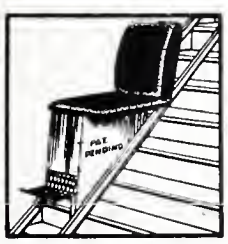
Digitaline Nativelle, chief active principle of digitalis purpurea, is featured in a comprehensive exhibit of the Varick Pharmacal Company. This world renowned cardiotonie—the first of the digitoxins—has become especially favored because of its more complete absorption and its uniform rate of dissipation which enable it to maintain the maximum efficiency obtainable. Shown in conjunction is the new sodium and lithium free, salt substitute, Diasal, which so remarkably duplicates the taste and texture of salt. Diasal, for patients on low-sodium diets, helps restore flavor to bland saltless foods and keeps dieters on their diets.

VAN PELT & BROWN, INC., RICHMOND, VA. BOOTH 17.

S. H. CAMP AND COMPANY, JACKSON, MICH. BOOTH 18.

S. H. Camp & Company displays a complete line of Camp Anatomical Supports for prenatal, postnatal, visceroptosis, sacro-iliac, hernia and other specific conditions. Experts from the Camp staff are in attendance to answer questions pertaining to the scientific application of these supports and to advise regarding the availability of them in authorized service departments of stores throughout the country.

ELECTRO-LIFT CHAIR CORPORATION, KANSAS CITY. BOOTH 19.



Demonstrating the low cost residence Stair Elevator for heart patients, rheumatism and arthritic sufferers, and others who should not or cannot climb stairs. Electrically operated—completely automatic—completely safe. No cutting into or marring of walls or woodwork in installation. No special wiring required—plug into nearest electrical outlet. Directed up or down by a single Control Lever and stopping itself Automatically at top and bottom Stair-O-Matic can be operated with ease and safety even by those with severe handicaps.

V. MUELLER & CO., CHICAGO. BOOTH 20.

WM. P. POYTHRESS & CO., INC., RICHMOND, VA. BOOTH 21.

Trocinate, an antispasmodic drug of exceptional potency and extremely low toxicity, is featured at the Poythress exhibit. Trocinate is available in 100 milligram tablets and in combination with Phenobarbital. Information, samples and literature on Trocinate and our other well known proprietary specialties, Solfoton, T.C.S., Merpectogel, and Panalgesic, will be made available by Mr. Walter Kaempf, Jr., and Mr. James Clark. They will appreciate your interest.

UNITED MEDICAL EQUIPMENT CO., KANSAS CITY. BOOTH 22.

C. B. FLEET CO., INC., LYNCHBURG, VA. BOOTH 23.

C. B. Fleet Co., Inc., cordially invites you to stop by Booth 23 for a visit with Mr. Paul Holsapfel, their representative. Perhaps there is something about Phospho-

Soda (Fleet), the pure, stable, aqueous concentrate of the two U. S. P. Sodium Phosphates, you would like to discuss with him.

Ciba Pharmaceutical Products, Inc., Summit, N. J. Booth 24.

Ciba Pharmaceutical Products, Inc., invites you to visit its exhibit which is featuring Priscoline Hydrochloride, an adrenolytic and sympathicolytic agent that produces peripheral vasodilation. Representatives in attendance will gladly discuss the role of Priscoline in the treatment of peripheral vascular disease.

G. D. Searle & Co., Chicago. Booth 25.

You are cordially invited to visit the Searle booth where our representatives will be happy to answer any questions regarding Searle Products of Research. Featured are Banthine, the true anticholinergic drug for the treatment of peptic ulcers; Dramamine, for the prevention and active treatment of motion sickness; and Alidase. Searle brand of hyaluronidase which permits subcutaneous feedings at intravenous speed. Other time proven products of Searle Research on which information may be obtained are Searle Aminophyllin in all dosage forms. Metamucil, Ketochol, Floraquin, Kiophyllin, Diodoquin, Pavatrine and Pavatrine with Phenobarbital.

Carnation Company, Los Angeles. Booth 26.

You are invited to visit Booth 26 where you will see an attractive animated display. Valuable information on the use of Carnation Evaporated Milk for infant feeding and child feeding is presented and the method by which Carnation is generously fortified with pure crystalline Vitamin D 400 U. S. P. Units per reconstituted quart is explained.

Goetze Niemer Company, St. Joseph. Booth 27.

The National Drug Company, Philadelphia. Booth 30.

You are cordially invited to visit the booth of The National Drug Company. On display are a few of National's leading pharmaceutical and biological products. The products featured are Benat Drops, Tablets and Injectosol, together with Natrinil, Resinat and AVC Improved. Also on display are Protinal Powder, Resion, Ammivin and DTP. Trained representatives will be in attendance to discuss with all visiting physicians National's vast array of pharmaceutical and biological products.

Lanteen Medical Laboratories, Inc., Evanston. Booth 31.

Lanteen Medical Laboratories, Inc., cordially invite physicians to visit Booth 31. Representatives will be happy to discuss the latest developments in diaphragm fitting technic. Also on display is the complete line of Lanteen pharmaceutical specialties and injectables materials.

Sharpe & Dohme, Philadelphia. Booth 32.

Clinical data from the laboratories of the Medical Research Division of Sharp & Dohme are featured in Booth 32. The potentiating effect of a combination of the antibiotics, bacitracin and tryothrician; the synergistic effect of penicillin in conjunction with the sulfonamides; and the use of Blood Group Specific Substances A and B in conditioning Group O blood, are of major interest.

Dairy Council of Greater Kansas City, Kansas City. Booth 33.

A mechanical educational display showing the importance of a well balanced diet. A display of health education materials carrying the seal of the American Medical Association. These are useful as reference material and for patient education. Many doctors have found "Newer Knowledge of Milk" particularly valuable as a reference booklet.

Sandoz Chemical Works, Inc., New York. Booth 34.

Pet Milk Company, St. Louis. Booth 35.

Specially trained representatives are in attendance to discuss the use of Pet Milk in infant feeding, and to present many services that are time-savers for busy physicians. Miniature Pet Milk cans will be given to visitors at the exhibit.

Wyeth, Inc., Philadelphia. Booth 36.

Wychol—potent lipotropic therapy combining choline and inositol and Sulfose—triple sulfonamide therapy is featured along with such widely prescribed ethical specialties as S-M-A, Wydase, Purodigin, Sopronol, Kaomagma, Wycillin, Lentopen, Phosphaljel, Petrogalar, Conestron, Propion Gel and Propion Opthalmic.

The Borden Company, New York. Booth 37.

Borden representatives will be more than pleased to discuss a new powdered infant food with you. Bremil is a completely modified milk in which nutritionally essential elements of cow's milk have been adjusted to supply the nutritional requirements of infants deprived of human milk. Clinical, x-ray and laboratory evidence with a large group of infants fed exclusively on Bremil proved conclusively its efficacy as an infant food. Bremil is a new phase in infant feeding. Likewise exhibited are our long established products for infant feeding: Biolac, Dryco, Mull-Soy, Merrell-Soule Special Milks, general purpose Klim, and Beta Lactose.

Doho Chemical Corporation, New York. Booth 38.

The Doho Chemical Corporation and its subsidiary, Mallon Chemical Corporation, makers of Auralgan, O-Tos-Mo-San and Rectalgan, are proud to announce their new nasal decongestant. Rhinalgan, a balanced formulation of two active chemical compounds that gives prolonged vasoconstriction—used as a spray, in our patented Dohony Spray-O-Mizer (combination dropper and spray)—pleasant

CARBOXCEL*

Brand of Sodium Carboxymethylcellulose 0.5 Gram in each tablet.

For Use in the Management of Chronic Constipation.

CARBOXCEL passes through the stomach and small intestines as a viscid fluid and thickens to a smooth gel in the colon thus providing bulk for soft, lubricated stools. It is used advantageously in hemorrhoids and proctitis as the soft, lubricated stool minimizes trauma to the anal tissue during defecation.

SUGGESTED DOSAGE: Beginning dosage is 4 (or more) tablets, four times daily accompanied by a glassful of water. In patients accustomed to taking cathartics ½ the usual dose of the cathartic should be given with CARBOXCEL for a few days, then ¼ of the cathartic dose for a few days longer, then CARBOXCEL alone.

Completely Harmless, Even for Long-Term Use.

CARBOXCEL is supplied in bottles of 100 Tablets (.80c), 500 Tablets ($3.30) and 1000 Tablets ($6.00).

AT PRESCRIPTION DRUGGISTS OR DIRECT FROM

O'CONNELL BROS. INC.

Ethical Pharmaceuticals

1929-31 O'Connell Ave. St. Louis 14, Mo.

*Trademark.

PARK LANE MEMORIAL HOSPITAL

St. Louis, Missouri

NEW BUILDING

Well equipped for Medical and Surgical Services

FOrest 2825 FOrest 2826

Profession Welcome

Directed by Medical and Surgical Staff

Relationship of Stress to Autonomic Lability

Studies in psychosomatics have shown that functional disorders often are a result of the patient's inability to adjust to emotionally stressful situations (stressor factors).

Nervous tension and chronic anxiety, discharged through a labile Autonomic Nervous System, can cause somatic disturbance. [1,2] Such states may involve any one of the organ systems or several at one time. [1,3] The outline below is designed to relate gastrointestinal and cardiovascular symptomatology to the exaggerated response of the autonomic nervous system.

	Physiologic Effects of Autonomic Discharge	
	Sympathetic	Parasympathetic
Gastro-intestinal System	Hypomotility Intestinal Atony Hyposecretion Reduced salivation	Hypermotility Gastrointestinal spasm Hypersecretion
Cardio-vascular System	Rapid heart rate Peripheral vaso-constriction	Slow heart rate Vasodilatation
Functional Manifestations	Palpitation Tachycardia Elevated blood pressure Dry mouth and throat	Heartburn Nausea-vomiting Low blood pressure Colonic spasm

The data here tabulated is from references [3,4,5,6,7] given below.

When the clinical picture is suggestive of functional disorder, the diagnosis is supported by the presence of the following indications of autonomic lability:

Variable Blood Pressure
Body Temperature Variations
Changing pulse rate
Deviations in B. M. R.
Exaggerated Cold Pressure Reflex
Oculo-Cardiac Reflex Abnormalities
Glucose Tolerance Alterations

Therapy in these cases is directed toward: 1) relieving the somatic disturbance to prepare the patient for psychotherapy*; 2) guidance in making adjustment to stressful situations and correction of unhealthy attitudes.

*Drug treatment using adrenergic and cholinergic blocking agents in conjunction with sedatives. [8,9,10]

1. Ebaugh, F.: Postgrad. Med. *4:* 208, 1948. 2. Wilbur, D.: J.A.M.A. *141:* 1199, 1949. 3. Williams, E. and Carmichael, C.: J. Nat'l. Med. Assoc. *42:* 32, 1950. 4. Goodman, L. and Gilman, A.: The Pharmacological Basis of Therapeutics, The Macmillan Co., 1941. 5. Katz, L. et al: Ann. Int. Med. *27:* 261, 1947. 6. Weiss, E. et al: Am. J. Psychiat. *107:* 264, 1950. 7. Alvarez, W.: Chicago Med. Soc. Bulletin, 581, 1950. 8. Rakoff, A.: A Course in Practical Therapeutics, Williams and Wilkins, 1948. 9. Karnosh, L. and Zucker, E.: A Handbook of Psychiatry. C. V. Mosby Co., 1945. 10. Harris, L.: Canad. M.A.J. *58:* 251, 1948.

Sandoz Pharmaceuticals

DIVISION OF SANDOZ CHEMICAL WORKS, INC.
68 CHARLTON STREET, NEW YORK 14, NEW YORK

WHETHER THE REASONS ARE PHYSICAL OR PSYCHOLOGIC..



When for a physical or psychologic reason, the physician decides to depend on a spermatocidal jelly to protect the patient, he cannot do better than prescribe the "RAMSES"* Vaginal Jelly† Set No. 3.

Used as directed, the plastic applicator deposits 5 cc. of "RAMSES" Vaginal Jelly over the cervical os.

The cohesive and adherent properties of "RAMSES" Vaginal Jelly are of such high degree that the cervix remains occluded for as long as ten hours after coitus. "RAMSES" Vaginal Jelly, with its adjusted melting point, is not excessively lubricating or liquefying. "RAMSES" Vaginal Jelly exceeds the minimum spermatocidal requirement of the Council on Pharmacy and Chemistry of the American Medical Association.

AVAILABLE in a regular 3-ounce tube and an economy-size 5-ounce tube.

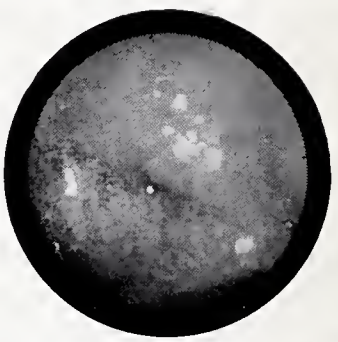


Photo taken after insertion of "RAMSES" Vaginal Jelly. Os occluded.

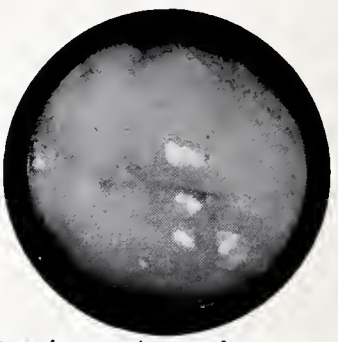


Photo taken ten hours after coitus. Occlusion still manifest.

Jelly stained with nonspermatocidal concentrotion of methylene blue for photographic purposes.



gynecological division

JULIUS SCHMID, INC., 423 West 55th St., New York 19, N. Y.

quality first since 1883

*The word "RAMSES" is a registered trademark of Julius Schmid, Inc. †Active Ingredients: Dodecoethyleneglycol Monolaurate 5%; Boric Acid 1%; Alcohol 5%.

tasting, with no systemic effect (pressor or respiratory), and can be safely used for infants and children. Our representatives will be happy to explain the merits of Rhinalgan and distribute samples of this innovation.

THE NESTLE CO., INC., NEW YORK. BOOTH 39.

CHAS. PFIZER & CO., INC., BROOKLYN. BOOTH 40.

H. G. FISCHER & CO., FRANKLIN PARK, ILL. BOOTH 45.

At Booth 45 inspect H. G. Fischer & Co.'s modern, efficient, low priced x-ray and physical therapy equipment. Let them point out many features of advantage in these representative units and other models not on display, also explain their extremely liberal terms of sale. Your visit welcome—no obligation.

SMITH, KLINE & FRENCH LABORATORIES, PHILADELPHIA. BOOTH 46.

"Resodec" is a revolutionary new development in the management of congestive heart failure. This remarkable substance produces the effect of cutting the patient's salt intake approximately in half. It does this by removing sodium from the contents of the intestinal tract and carrying it out of the body in the feces. Thus, "Resodec" not only gives a positive means of achieving adequate sodium control—but also frequently allows patients greater leeway in selecting foods.

ELI LILLY AND COMPANY, INDIANAPOLIS. BOOTH 47.

Your Lilly medical service representative cordially invites you to visit the Lilly exhibit located in Booth 47. Many new therapeutic developments are featured and literature on these products is available. Visiting physicians will be aided in every way possible.

SIMILAC DIVISION, M & R LABORATORIES, COLUMBUS. BOOTH 48.

Our representatives for Similac and Cerevim will appreciate the opportunity to discuss with you the merits and use of our products in the field of infant and child nutrition.

PRODUCERS CREAMERY COMPANY, SPRINGFIELD, MO. BOOTH 49.

The Daricraft exhibit features an information service on the advantages of the use of Daricraft Homogenized Evaporated Milk for special diets, including infant feeding. C. H. Bruce of Kansas City is in charge of the exhibit. Photographs showing the modern Daricraft plants in operation and laboratory data concerning the product are part of the display.

MEDCO PRODUCTS CO., TULSA, OKLA. BOOTH 50.

Make it a point to visit our booth where our representative will be glad to demonstrate the Council Accepted Medcotronic.

SEALY MATTRESS COMPANY, KANSAS CITY. BOOTHS 51 AND 52.

The Sealy Mattress Company has on display the Sealy Firm-o-rest Orthopedic innerspring mattress and box spring which today is the largest selling Orthopedic mattress in the world. The Sealy Firm-o-rest Orthopedic innerspring mattress is the only Orthopedic mattress to be accepted for advertising by the journals of the American Medical Association and also to be granted the Good Housekeeping Seal of Approval. Two men will be on duty at all times to full acquaint the Doctors with this innovation in the field of bedding. A contest will be conducted among the Doctors with the winner receiving a Sealy Firm-o-rest Orthopedic innerspring mattress.

THE UPJOHN COMPANY, KALAMAZOO. BOOTH 53.

The Upjohn exhibit presents the anticoagulant family: Heparin, Depo-Heparin and Dicumarol, with particular emphasis placed upon Depo-Heparin. When Heparin is prepared in a gelatin vehicle (Depo-Heparin) and administered intramuscularly, markedly prolonged effects are obtained. A single injection of 1 cc. (200 mg.) of Depo-Heparin will prolong the blood coagulation time for about twenty-four hours.

A. H. ROBINS COMPANY, INC., RICHMOND, VA. BOOTH 54.

The A. H. Robins Company display is featuring the sedative-antispasmodic, Donnatal; the antirheumatic, Pabalate; Entozyme, digestant with the unique "peptomatic" action; Allbee with C, high potency "B" Complex Capsule with ascorbic acid; and Phenaphen with Codeine, our new analgesic. Robins' Medical Service Representatives will welcome the privilege of discussing with physicians attending the Assembly these and other products in the company's line of prescription specialties.

GENERAL ELECTRIC X-RAY CORPORATION, MILWAUKEE. BOOTHS 55 AND 56.

The General Electric X-Ray Corporation is manufacturer of complete x-ray equipment from portable diagnostic to 2,000,000 volt therapy apparatus—electrocardiograph—diathermy—x-ray accessories and supplies. GE's service is available to you at more than sixty offices throughout the United States and Canada. Why not discuss your particular problems with us?

A. S. ALOE COMPANY, KANSAS CITY. BOOTH 57.

MEAD JOHNSON & COMPANY, EVANSVILLE. BOOTH 58.

Mead Johnson & Company is featuring Lactum and Dalactum, convenient formulas of evaporated milk containing Dextri-Maltose; three water-soluble vitamin

preparations, Poly-Vi-Sol, Tri-Vi-Sol and Ce-Vi-Sol; Fer-In-Sol, a palatable, highly concentrated solution of ferrous sulfate, and Poly-Vi-Caps, multiple vitamin capsules for older children. Representatives in attendance will be glad to furnish information regarding these products.

C. W. Alban & Co., Inc., St. Louis. Booth 59.

C. W. Alban Company is displaying the newest editions in medical publications along with diagnostic instruments. Alban Company renders a complete service in medical books of all publishers, the best in surgical instruments of quality including the famous "Stille Sweden." The microscope department features new and used instruments. Microscope cleaning, repairing and overhauling in every detail is a service regularly available. Your visit to the booth will be appreciated.

Swift & Company, Chicago. Booth 60.

Liver & Bacon—a new addition to the original line of all-meat baby foods, Swift's Meats for Babies & Juniors, are featured at the Swift exhibit. This brings the varieties of Strained and Chopped Meats offered in the Swift line up to 7. You are cordially invited to discuss the use of these high-protein, body-building foods in the infant diet with the Swift representatives—also their rapidly growing use in adult special diets. Literature and information on clinical research available.

Dumas-Wilson & Co., St. Louis. Booth 61.

Dumas-Wilson & Co. extends a cordial invitation to the physicians attending this Annual Session to visit our booth featuring: Pas and Sodium Pas, Granules—Tablets—Powder; Fortified Tablets—Yeast Chips. Complete dietary supplements; Amphex—Cellodex-Antibese. For obesity and weight control.

Medical Protective Company, Fort Wayne. Booth 62.

Specializing Exclusively in Professional Protection since 1899, The Medical Protective Company provides representation at Booth 62, familiar with all the complexities of professional liability by special training and long experience. An answer to your problems in the Doctor-Patient relationship is yours for the asking.

Eisele & Company, Nashville, Tenn. Booth 63.

The Eisele & Company line of green and white plungered hypodermic syringes with plain luer, lock and metal tip, also Interchangeable type as well as our complete line of clinical thermometers, hypodermic needles and specialty glassware for the profession.

Philip Morris & Co., Ltd., Inc., New York. Booth 64.

Philip Morris and Company will show the results of research on the irritant effects of cigarette smoke. These results show conclusively that Philip Morris are less irritating than other cigarettes. An interesting demonstration will be made on smokers at the exhibit which will show the difference in cigarettes.

Ames Company, Inc., Elkhart, Ind. Booth 65.

The Ames Diagnostic Kit is featured. This shall kit, measuring 3 by 9 inches contains Clinitest—a test for urine-sugar, Bimintest—a test for albumin, Acetest—a test for acetone, and Hematest—a test for occult blood. No extra reagents, equipment or accessories are needed. This kit is designed for the physician's office, small laboratory, hospital floor use. The Ames representatives will be demonstrating these tests. Ames Company representatives will be glad to discuss Decholin and Decholin Sodium, the standard hydrocholeratic agents for the treatment of biliary tract diseases.

E. R. Squibb & Sons, New York. Booth 66.

E. R. Squibb & Sons looks forward to see you at the Annual Session of the Missouri State Medical Association. In support of the active scientific program which has been arranged, you will find the Squibb representative glad to discuss all relative products. Also, for your convenience, selected professional literature will be available which you may take or request us to send to your home. Please visit the Squibb booth.

The Baby Development Clinic, Chicago. Booth 54.

The Baby Development Clinic are featuring the psychologic aspects of feeding, as well as several products suited to infant and child feeding and care. The manufacturers of these products support the educational work of this organization. The Baby Development Clinic will announce a new service to be known as the Maternity Counselling Service which will be of interest to doctors for their maternity patients.

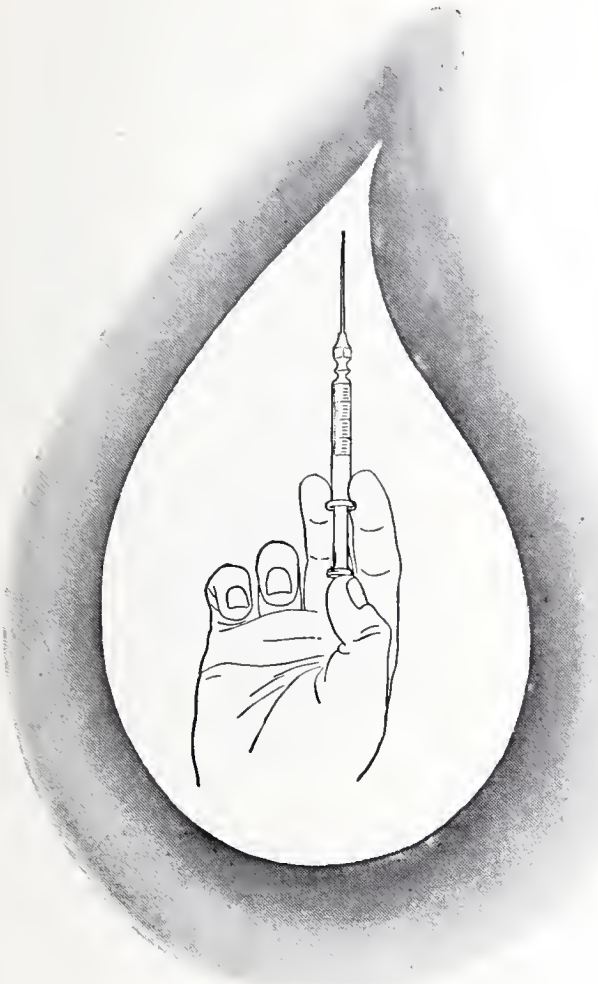
Winthrop-Stearns, Inc., New York. Booth 68.

Winthrop-Stearns, Inc., invite you to visit Booth 68 where the following products are featured—Levophed, the true vasoconstrictor hormone of the adrenal medulla, for the maintenance of blood pressure in shock and other acute hypotensive states; Thenfadil, a new and better antihistaminic which is exceptionally effective in bronchial asthma (82 per cent) as well as other common allergic disorders; Phisoderm with Hexachlorophene 3 per cent, hypoallergenic, soap-free sudsing detergent with antibacterial properties on routine use.

Coca-Cola Company, Atlanta, Ga. Booth 69.

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Extensive experimental studies [6, 9, 16-18] ***proved* CRYSTALLINE DIHYDROSTREPTOMYCIN SULFATE MERCK *less toxic for the vestibular system.***

BIBLIOGRAPHY

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by Joe Marsh

Right Under Our Nose!

Sometime back, we got word from the Governor, asking if we wanted to use the State Fire Inspection Team—a group of experts they send around to inspect public buildings.

We sent a letter saying: "Okay! Give us the once-over!" They came down, all right—last week.

After the inspection, we got their report. Came out pretty well. Town Hall and the School were O.K. Post Office just needed more sandbuckets. In fact, everything got a clean bill of health, except—the Fire Station!

From where I sit, we volunteer firemen had just been too blamed busy keeping *everyone else* on the ball—to realize our own firehouse was not up to snuff. We were like those people who worry so much about the other fellow's business—whether he can really afford that new car, how or where he should follow his profession, why he likes a glass of beer—that they forget to take a good critical look at themselves!

Joe Marsh

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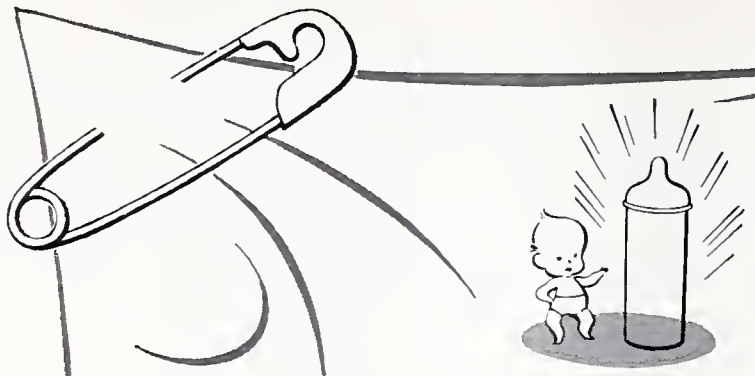
MISSOURI SOCIETY OF MEDICAL TECHNOLOGISTS

All technologists in Missouri are invited to the fourth Annual Session of the Missouri Society of Medical Technologists which will be held April 23, 24 and 25, at the Municipal Auditorium, Kansas City.

SCIENTIFIC PROGRAM

Monday, April 23, 1951, Municipal Auditorium, Room 502

Presiding: Miss Doris Clark, B.S., M.T. (ASCP); Alternate, Miss Racheal Creager, M.T. (ASCP).



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9:15 a. m. Invocation, Reverend William Rutherford, Pastor, Glenwood Park Methodist Church, Kansas City.

9:20 a. m. Newer Concepts in Blood Coagulation and Improved Methods of Measuring Coaguability, William Harrington, M.D., Washington University School of Medicine; Associate Director of Laboratories, Barnes Hospital, St. Louis.

10:00 a. m. The Use of Adrenocortotrophichormone in Diagnosis and Treatment of Disease and the Laboratory Tests Used in Its Evaluation, C. Stewart Gillmor, M.D., Research Fellow in Arthritis, New York Hospital; Chief of Clinic, General Hospital; Medical Staff, St. Joseph's Hospital, Kansas City.

10:45 a. m. Intermission to view exhibits and demonstrations.

11:30 a. m. Program continued with Missouri Medical Association, Little Theater, Municipal Auditorium.

Rh and Hr Sensitization in Obstetrics, W. D. Beacham, M.D., New Orleans, La.

10:50 a. m. Problem Clinic and Demonstrations, Arena, Municipal Auditorium.
Presiding: Miss Eunice Stoltenberg, M.T. (ASCP), and Frederick Coleman, M.D.

RBC Fragility Test, Louise O'Connell, M.T. (ASCP).
Total Eosinophil Counts, Hematology Dept., St. Luke's Hospital.
Carbo-wax Tissue Impregnation, Jane Coates, M.T. (ASCP).
Hematology, Sister Leo Rita, M.T. (ASCP).
Bone Decalcifier, Mary Sharbel.
Blood Grouping and Rh in Civilian Defense, Audrey Murphy, M.T. (ASCP).
Flame Photometer, Esther Reed, M.T. (ASCP).
Mycology Demonstration (Dermatophytes and Candida), Barbara Joyce, M.T. (ASCP); Dorothy Gwin, M.T. (ASCP).

Monday, April 23, 1951, Municipal Auditorium, Room 502

Presiding: Mrs. Ruth Branson, B.S., M.T. (ASCP), Springfield; Alternate: Patricia Thomas, B.S., M.T. (ASCP), St. Louis.

2:00 p. m. Panel Discussion on Flame Photometry, Anne Sommer, B.S., M.T. (ASCP), Firmin Desloge Hospital, St. Louis; Miss Louise Wells, B.S., M.T. (ASCP), Chief Technologist, Special Chemistry Laboratory, University of Kansas Medical Center.

2:45 p. m. Intermission to view exhibits and demonstrations.
Presiding: Miss Esther Reed, M.T. (ASCP), and Ralph E. Duncan, M.D.

2:45 p. m. Problem Clinic and Demonstration, Arena, Municipal Auditorium.
Flame Photometry—Esther Reed, M.T. (ASCP).

Tuesday, April 24, 1951, Municipal Auditorium, Room 502

Presiding: Miss Mildred Oswald, B.S., M.T. (ASCP); Alternate: Bernice Koster, M.T. (ASCP).

9:15 a. m. Prostigmine Diastase Levels, Miss Elizabeth Wesley, M.T. (ASCP).

9:35 a. m. Factors Influencing Blood Cholesterol Determinations, Hildegarde Kramer, Chief Technician in Chemistry, Clinical Pathology Laboratory, St. Louis.

10:00 a. m. Pitfalls Encountered in Operating a Hospital Blood Bank, Sister Anna Cecilia (Brennen), C.S.J., B.S., M.T. (ASCP), Laboratory Supervisor, St. Joseph Hospital, Kansas City.

10:30 a. m. Evaluation of the Newer Leads in Electrocardiography, Graham Asher, M.D., F.A.C.P., Associate Professor of Medicine, University of Kansas School of Medicine, Member of Scientific Council of the American Heart Assn., Kansas City.

11:00 a. m. Intermission to view exhibits.

11:10 a. m. Problem Clinic and Demonstrations, Arena, Municipal Auditorium.

Presiding: Miss Frances Wolfskill, M.T. (ASCP), and Russell Kerr, M.D.
Blood Grouping and Rh in Civilian Defense.
RBC Fragility Test, Louise O'Connell, M.T. (ASCP).
Total Eosinophil Counts, Hematology Dept. St. Luke's Hospital.
Carbo-wax Tissue Impregnation, Jane Coates, M.T. (ASCP).
Bone Decalcifier, Mary Sharbel.
Flame Photometry, Esther Reed, M.T. (ASCP).
Parasitology, Catherine Roedecker, M.T. (ASCP).
Mycology Demonstration (Dermatophytes and Candida), Barbara Joyce, M.T. (ASCP); Dorothy Gwin, M.T. (ASCP).

Tuesday, April 24, 1951, Municipal Auditorium, Room 502

Presiding: Emma Mae Baldwin, B.S., M.T. (ASCP); Alternate: Lydia Pahmeier, M.T. (ASCP).

2:00 p. m. Bacille Calmette-Guerin, Finn Fischer, M.D., Resident in Medicine, General Hospital, Kansas City.

2:30 p. m. Carbo-wax Tissue Impregnation, Jane Coates, M.T. (ASCP), Chief Technician, Department of Histology, General Hospital, Kansas City.

2:50 p. m. Civilian Defense, Audrey Murphy, B.S., M.T. (ASCP), Chairman of Public Relations Committee, Missouri Society of Medical Technologists, St. Louis.

3:15 p. m. Intermission to view exhibits and demonstrations or continue scientific session with Missouri State Medical Association.

3:30 p. m. Symposium on Hematology presented by Missouri State Medical Association, Little Theater, Municipal Auditorium.

3:30 p. m. Problem Clinic and Demonstrations, Arena, Municipal Auditorium.

Presiding: Miss Mercedes Barry, M.T. (ASCP); Alternate, Victor Buhler, M.D.
RBC Fragility Test, Louise O'Connell.
Total Eosinophil Counts, Hematology Department, St. Luke's Hospital.
Carbo-wax Tissue Impregnation, Jane Coates.
Hematology, Sister Leo Rita.
Parasitology, Catherine Roedecker.
Bone Decalcifier, Mary Sharbel.
Blood Grouping and Rh in Civilian Defense, Audrey Murphy.
Mycology Demonstration (Dermatophytes and Candida), Barbara Joyce; Dorothy Gwin.

Wednesday, April 25, 1951, Municipal Auditorium, Room 502

Presiding: Mrs. Jean Rutherford Goodding, B.S., M.T. (ASCP); Alternate: Audrey Murphy, M.T. (ASCP).

9:15 a. m. Salmonella Pullorum in Relation to Human Infection, Sister Agnes Moreen (Costigan), S.S.M., M.T. (ASCP), St. Mary's Hospital, St. Louis.

9:35 a. m. Erthrocyte Fragility Test Performed Spectrophotometrically, Louis O'Connell, M.T. (ASCP), Chief Technologist in Hematology, General Hospital, Kansas City.

10:00 a. m. New Staining Technic in Mycology, Louise Kroenert, B.A., M.T. (ASCP), General Hospital, Kansas City.

10:30 a. m. Intermission to view exhibits and demonstrations.

Scientific Exhibits

Blood Grouping and Rh in Civilian Defense.
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Constitution and By-laws.

No activity pause at her menopause



Your patient may continue her normal activities even to the extent of keeping pace with her daughter. She will be greatly encouraged, especially when the effectiveness of therapy measures up to expectations. In estrogen therapy an especially useful product . . . . . is:

BENZESTROL

2,4 (p-hydroxyphenyl) –3–ethyl hexane

"Liver function tests, blood studies and urine examinations showed no toxic effects of the synthetic substance BENZESTROL"*

Supplied:

Oral: ***Benzestrol*** **Tablets**
0.5 Mg., 1.0 Mg., 100's & 1000's, 2 Mg.,
5 Mg. — 50's — 100's — 1000's.

Benzestrol **Elixir:**
15 Mg. per fluid ounce, Pint Bottles.

Intramuscular: ***Benzestrol*** **Solution in Oil;**
Aqueous Suspension with 5% Benzyl Alcohol
5.0 Mg. per cc. 10cc Vials.

Local: ***Benzestrol*** **Vaginal Tablets**
0.5 Mg. 100's.

AVERAGE DOSE: Menopause — 2 to 3 Mg. daily orally or ½ to 1cc parenterally every 5 days.

Schieffelin — Quality Integrity Service — ACCEPTED — Council on Pharmacy and Chemistry — American Medical Association

Professional Samples and Literature upon Request

NOTE:
Frequently, medication other than estrogens may be required during the menopause. Pleasant tasting Elixir Benzestrol is compatible with many substances.

*Reference: MacBryde, C. M., et. al., A New Synthetic Estrogen, J.A.M.A., 123: 261: 264-(10-2) 43.

Schieffelin & Co. 20 Cooper Square, New York 3, N. Y.

City View Sanitarium

For the diagnosis and treatment of mental and nervous disorders, alcoholism and drug addictions.

Established in 1907 by the late John W. Stevens, M.D. 52 acres near city. Separate buildings for men and women. Two full time psychiatrists. Electric shock and insulin therapy in selected cases. Occupational therapy. Physiotherapy department. Adequate laboratory facilities.

NASHVILLE, TENNESSEE

HAMILTON-SCHMIDT SURGICAL COMPANY

St. Louis, Missouri

Surgical Instruments, Invalid and Sick Room Supplies
Post-Operative Belts, Elastic Hosiery and Trusses Fitted

CEntral 1680 REGISTERED NURSE IN ATTENDANCE **215 North Tenth Street**



Theocalcin

for the failing heart

A Wise Choice of Diuretic
and
Myocardial Stimulant

TIME PROVED - EFFECTIVE ORALLY
EASILY TOLERATED

To reduce edema and diminish dyspnea and to improve heart action prescribe 1 to 3 Theocalcin Tablets (7½ gr. each) t. i. d.

Theocalcin (theobromine-calcium salicylate), Trade Mark, Bilhuber.

BILHUBER-KNOLL CORP. ORANGE NEW JERSEY

DIVISION OF HEALTH

To the Editor:

The Department of Health of the State of Missouri has four responsibilities:

1. Public need for health supervision.
2. The detection, prevention and elimination of disease.
3. The coordinating of all agencies having activities concerning the health of the citizens of the state.
4. To be a consultant or an assistant to any group or any citizen of the state that has a health problem.

The most serious problem faced, as your Director of Health, has been the lack of understanding between the public health representatives and organized medicine. It has been somewhat baffling to find many state organizations, such as Cancer, Tuberculosis, Heart, Polio, and Crippled Children societies and our State Association committees attacking health problems independently. Many meetings have been held with the various groups, real cooperation is being perfected in a most encouraging way.

In the Department of Health we have a highly trained group of public health representatives, their activities have been increasingly efficient; all of them have been most cooperative in every problem I have had in the last year. There are thirteen department heads: Doctors, Dentists, Nurses, Environmental Engineers, Food and Drug, Finances, Laboratory, Educators and Vital Statistics. Also the head of each department has trained assistants, whose training is determined by the Missouri State Merit System.

May I state with emphasis, the philosophy of my office is that health problems cannot be efficiently solved without cooperation of the Public Health Department and Organized Medicine!

In the last year, the Ellis Fischel Hospital has been manned with representative diplomats of the various Boards, Surgery, Medicine, Pathology and Radio-Therapy. Every cancer organization of the state is now united in all activities associated with the Ellis Fischel Hospital. Six months ago there was a waiting list of 200. Today an emergency case can be taken care of in just a few days.

The Missouri Tuberculosis Society—The State Medical Association committee is not only cooperating with the Tuberculosis department in a state-wide program but is giving valuable assistance in making the Mt. Vernon Sanitorium equally as efficient as the Ellis Fischel Hospital. In both institutions, notable assistance has been had from the Washington University, St. Louis University, and Missouri University faculties.

St. Louis University has presented a heart program in each of the Councilor Districts in cooperation with the State Medical Association and my office. Also St. Louis University has been holding regular heart clinics for the general profession.

In our Mental Health program, St. Louis Health Department, St. Louis County Health Department and Washington University, in cooperation, are developing a most interesting program. The same is being perfected in St. Joseph and Kansas City. In each of the State Mental Institutions diagnostic clinics for patients have been established, these are open to the referred patients of the doctors of the state.

The State Association Committee on Venereal Diseases developed a statewide program with the department in my office; during this year 2,000 less cases were reported compared to last year.

A committee from the State Pathology Society reviewed our laboratories with recommendations for changes in those laws concerning private laboratories. It is interesting to note that 500,000 tests were made last year for the department activities and for doctors of the state.

The Environmental Engineering department has to do with water, sewerage, stream pollution and every environmental problem in protecting health. In Missouri, three fourths of the water consumed is from the Missouri or the Mississippi rivers.

In the Food and Drug Department, several activities of interest are in progress.

Some six months ago only three milk centers were producing safe milk. Today there are fourteen such centers. Missouri is fast becoming the second state in the union as a milk producing state.

Several large cities have passed food laws which make it possible to grade eating places as to health standards and practices.

My plea to the general medical profession of our state is to join me, in the Health Department, on problems of health of the state; let us make your city, your town or your county a healthy place in which to live.

I can assure the profession of our personal and departmental cooperation at all times.

May I ask: Is this not an antidote for Socialized Medicine and the paying of special assessments in an attempt to regain public confidence? Is not the Health Department actually, your Health Department?

BUFORD G. HAMILTON, M.D.,
Director, Division of Health.

FINANCIAL STATEMENT FOR 1950

ROBERT A. LENNERTSON
CERTIFIED PUBLIC ACCOUNTANT
MEMBER—AMERICAN INSTITUTE OF ACCOUNTANTS

HOWARD E. SALOMO, C.P.A.
SAINT LOUIS, MISSOURI

February 28, 1951

Missouri State Medical Association,
634 North Grand Boulevard,
St. Louis, Missouri.

Gentlemen:

An examination has been made of the accounts of the Missouri State Medical Association for the year 1950 and a report is presented thereon together with the following attached statements:

Exhibit A. Balance Sheet.
Exhibit B. Statement of Income and Expenses.
Exhibit C. Statement of Committee and Meeting Expenses.
Exhibit D. Dues Receivable and Membership by Counties.

In connection with the statements, it should be noted that members' dues are taken into income on the cash basis whereas all other accounts are maintained on the accrual basis.

INFECTIONS OF THE URINARY TRAC

Results of therapy in 32 obstetrical and gynecological cases

	ORGANISM	NO. OF CASES	RESULTS		
			GOOD*	EQUIVOCAL	POOR
No organic or obstructive disease					
	B. coli	15	14	1	0
	A. aerogenes	4	4	0	0
	Aerobic diphtheroids	3	2	1	0
	S. albus	2	2	0	0
	Aerobic non-hemolytic streptococcus	2	2	0	0
	Ps. aeruginosa	1	0	1	0
With organic or obstructive disease					
	Ps. aeruginosa	3	1	0	2
	P. vulgaris	1	0	1	0
	A. aerogenes	1	1	0	0
	TOTALS	32	26	4	2

Douglas, R. G.; Ball, T. L., and Davis, I. F.: California Med. *73*:463 (Dec.) 1950

*"*A good result was recorded when in 72 hours or less the temperature fell to normal, the pyuria cleared, a negative culture was obtained and the patient was symptom-free."*

CRYSTALLINE

Terr

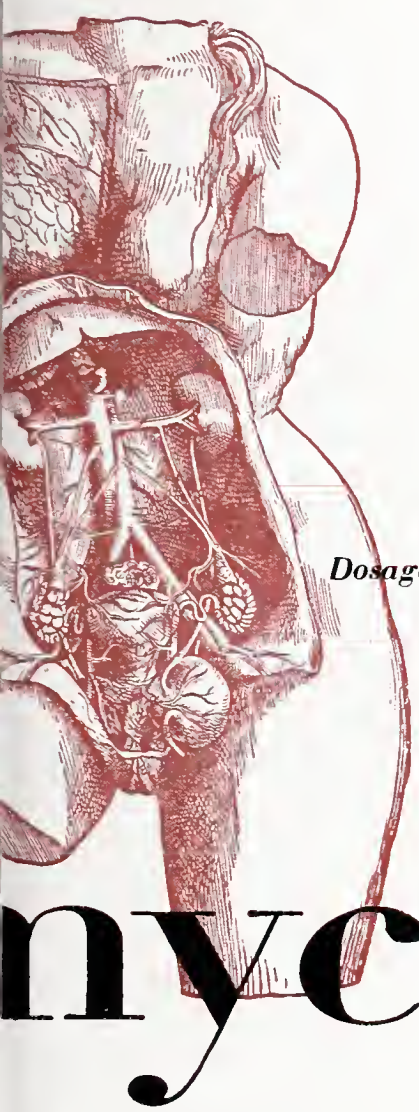
"The drug is tolerated by mouth and no serious side-reactions occur."

Douglas, R. G.; Ball, T. L., and Davis, I. F.: California Med. *73*:463 (Dec.) 1950.

Antibiotic L

TETRICAL AND GYNECOLOGICAL PATIENTS

"prompt and effective" response



"In cases in which there is no organic or obstructive disease, the response to Terramycin as a urinary antiseptic is prompt and effective."

"The patients with pyelitis of pregnancy or simple postoperative cysto-ureteritis responded very promptly....There was a prompt drop in temperature, disappearance of pyuria and bacilluria, and symptomatic relief."

Douglas, R. G.; Ball, T. L., and Davis, I. F.: California Med. *73*:463 (Dec.) 1950.

Dosage: 2 Gm. daily by mouth in divided doses q. 6 h. is suggested for most acute infections. In severe infections, a high initial dose (1.0 Gm.) or higher daily dosages (3 to 6 Gm.) should be used. Treatment should be continued for at least 48 hours after the patient's temperature has become normal and acute symptoms have subsided.

mycin

HYDROCHLORIDE

ACCEPTED COUNCIL ON PHARMACY AND CHEMISTRY AMERICAN MEDICAL ASSOCIATION

Supplied: 250 mg. capsules, bottles of 16 and 100;
100 mg. capsules, bottles of 25 and 100;
50 mg. capsules, bottles of 25 and 100.

Pfizer

CHAS. PFIZER & CO., INC., *Brooklyn 6, N.Y.*

Scope of Examination

The Balance Sheet as at December 31, 1950, and the Statement of Income and Expenses for the year 1950 were reviewed. Examinations or tests were made of accounting records, in the manner and to the extent deemed appropriate, but a detailed audit of the transactions was not made.

Cash in banks as shown by the books was reconciled with the regular monthly bank statements and confirmation letters received direct from the depositories. The petty cash fund of $25.00 and United States 2½ per cent Savings Bonds Series G with a par value of $55,000.00 were verified by physical inspection. U. S. bond interest in the amount of $1,375.00 has been properly accounted for on the books. Recorded cash receipts for the year were traced in total into the bank account as deposits and disbursements were substantiated by an inspection of paid checks, purchase invoices and other data on file. Selective tests were made of the income and expense accounts for the period.

Statement of Income and Expenses

The financial result of the Association's activities for the year 1950 was an excess of expenses over income in the amount of $13,112.38 as set forth in Exhibit B.

Balance Sheet

Exhibit A presents the asset and liability accounts of the Association at December 31, 1950, and comments follow on the more important Balance Sheet accounts not previously discussed.

Accounts receivable from Journal advertisers are summarized below as to date of charge:

Month of Charge	*Amount*
December 1950	$1,365.37
November 1950	17.40
October 1950	3.00
September 1950	30.00
Prior Jan. 1 to August 31, 1950	50.40
Total	$1,466.17

Account receivable, Exhibitor, in the amount of $125.00, represents an unpaid amount for exhibit space at the 1950 Annual Session.

Unpaid Members' Dues in the amount of $1,087.50, offset by a reserve account in a like amount, represents 1950 dues of delinquent members carried at the request of local societies; $405.00 of this amount was received during the first twelve days of 1951. Other individuals with delinquent dues at December 31, 1950, were dropped from membership in accordance with the by-laws. A summary of Dues Receivable and Membership by Counties, as shown by the Association's records, is presented in Exhibit B.

Furniture and Fixtures continue to be stated in the fixed amount of $1,000.00. No depreciation deduction is taken on the fixed assets since additions and repairs are charged to expense each year, in lieu of depreciation.

Records and data on file were carefully reviewed for liabilities at December 31, 1950, and it is believed that all current liabilities of substantial amount are included in the Balance Sheet. There is a contingent liability in the amount of $900.00 on three malpractice suits reported pending against members. The Association is required to furnish assistance in an amount not to exceed $300.00 in each case, under the provisions of its by-laws.

Advance payments in the amount of $2,010.00 were made by exhibitors to December 31, 1950, for exhibit space at the 1951 Annual Session and these payments will be taken into income when earned in 1951.

General

The following insurance was in force at the close of the year:

Insurance On	*Type of Coverage*	*Amount*
Furniture and Fixtures	Fire and Extended Coverage	$2,000.00
Treasurer	Fidelity Bond	20,000.00
Executive Secretary	Fidelity Bond	1,000.00
Employee	Life Endowment Policy with Disability Benefits (Cash Value $5,341.56)	12,000.00
Automobiles of Executive Secretary and Field Secretary	Non-Ownership—Bodily Injury	25/50,000.00
	Property Damage	5,000.00

Under the provisions of the non-ownership policy, the Executive Secretary is required to carry the following insurance:

Automobile—Executive Secretary	Bodily Injury	15/30,000.00
	Property Damage	5,000.00

The records of the Association have been well maintained during the year 1950 in conformity with generally accepted accounting principles, applied on a basis consistent with that of the preceding period.

Yours very truly,
R. A. Lennertson,
Certified Public Accountant.

Exhibit A

Missouri State Medical Association
Balance Sheet, December 31, 1950

ASSETS

Cash:		
Mercantile-Commerce Bank and Trust Company (Treasurer's Account)	$ 5,541.23	
Mercantile-Commerce National Bank (Secretary's Account)	159.889	
Petty Cash Fund	25.00	$ 5,726.12
U. S. Savings Bonds—Series G—Cost and Par Value		55,000.00
Accounts Receivable:		
Advertisers	$ 1,466.17	
Exhibitor	125.00	1,591.17
Dues Receivable—Exhibit D		1,087.50
Furniture and Fixtures		1,000.00
Advances for Traveling Expenses		59.43
		$64,464.22

LIABILITIES

Accounts Payable:		
Supplies and Expenses	$ 1,294.68	
Accrued Salary—Treasurer	1.00	
Federal Withholding and Social Security Taxes	474.79	$ 1,770.47
Deferred Credit to Income:		
Advance Payments by Exhibitors		2,010.00
Contingent Liability to Members on Three Malpractice Suits—$900.00.		
Reserve for Uncollected Dues		1,087.50
Reserve for Future Activities:		
Balance January 1, 1950	$ 72,708.63	
Excess of Expenses over Income for 1950 per Exhibit B	(13,112.38)	59,596.25
		$64,464.22

Exhibit B

Missouri State Medical Association
Statement of Income and Expenses for the Year 1950

Particulars	General Activities	Journal Publication	Together
INCOME			
Dues received (Includes $1.00 per member annually for The Journal)	$39,975.50	$ 2,995.00	$ 42,970.50
Rentals—Annual session exhibit space	8,875.00		8,875.00
Rent from subtenant (office space)	840.00		840.00
Subscriptions to The Journal—Non-members		151.00	151.00
Advertising space—The Journal		19,642.06	19,642.06
Interest on U. S. Savings Bonds	1,375.00		1,375.00
Total Income	$51,065.50	$22,788.06	$73,853.56
EXPENSES			
Salary—Executive Secretary	$ 4,600.00	$ 2,300.00	$ 6,900.00
Salary—Treasurer	1.00		1.00
Office Salaries	13,883.00	6,941.50	20,824.50
Employee's Retirement Insurance Premium	922.80		922.80
Office Rent and Light	2,577.55		2,577.55
Postage	1,354.90	426.04	1,780.94
Stationery, Printing and Office Supplies	1,545.26		1,545.26
Directories and Clipping Service	171.00		171.00
The Journal—Paper, Printing, Mailing, etc.		16,953.70	16,953.70
Cash Discounts to Advertisers		31.60	31.60
Commissions on Journal Advertising		1,692.52	1,692.52
Discounts to Exhibitors	30.00		30.00
Telephone and Telegraph	1,543.70		1,543.70
Insurance—General	76.83		76.83
Fees and General Expenses	1,182.66		1,782.66
Taxes—Social Security and Personal Property	282.90		282.90
Bad Debts	125.00		125.00
Traveling Expense — Executive Secretary	749.31		749.31
Traveling Expense—Field Secretary	1,733.29		1,733.29
Traveling Expenses—General	285.94		285.94
Committee and Meeting Expenses (Exhibit C)	27,318.57	171.89	27,490.46
Equipment	64.98		64.98
Total Expenses	$58,448.69	$28,517.25	$86,965.94
Net (Loss) for the Period	$(7,383.19)	$(5,729.19)	$(13,112.38)

Exhibit C

Missouri State Medical Association
Statement of Committee and Meeting Expenses for the Year 1950

Annual Session		$ 8,611.72
Council Meetings and Councilors' Expenses	$2,774.26	

Delegates to A. M. A.	1,831.90	
Women's Auxiliary	449.10	
Handbook	4,441.59	
History	943.86	
Procurement and Assignment	67.85	
Committee on Emergency Medical Service	631.72	11,140 28
Committees:		
Conservation of Eyesight	$ 45.01	
Rural Medicine	551.37	
Health and Public Instruction	115.34	
Public Policy and Relations	5,379.91	
Scientific and Postgraduate Work	1,059.05	
Tuberculosis	15.64	
Infant Care	35.63	
Control of Venereal Disease	13.17	
Constitution and By-Laws	351.45	
Sub-Total	$7,566.57	
Publication Committee	171.89	7,738.46
Total		$27,490.46

EXHIBIT D

Missouri State Medical Association
Dues Receivable and Membership by Counties
December 31, 1950

Counties	MEMBERSHIP Total	Active	Junior	Honor	1950 Dues	Prepaid Dues
Andrew	6	6			$ 15.00	
Audrain	14	12		2		
Barton-Dade	11	6	2	3		
Bates	10	9	1			
Benton	3	1		2		$ 15.00
Boone	58	51	4	3		
Buchanan	98	82		16		
Butler	25	22	1	2		
Caldwell-Livingston	16	16				
Callaway	15	9	1	5		
Camden	2	2				30.00
Cape Girardeau	39	33		6		
Carroll	7	6	1			75.00
Carter-Shannon	3	3				
Cass	16	11	1	4		
Charlton-Macon-Monroe-Randolph	43	29	1	13		
Clay	39	35	2	2	15.00	105.00
Clinton	9	8	1			
Cole	39	38		1		
Cooper	15	15				
Dallas-Hickory-Polk	10	9		1		
DeKalb	2	1		1		
Dunklin	28	21	3	4	30.00	270.00
Franklin	28	25	2	1		
Greene	129	113	5	11	30.00	
Grundy-Daviess	14	11		3	15.00	90.00
Harrison	4	3	1			
Henry	15	13	1	1		
Holt	5	3		2		
Howard	7	6	1			
Jackson	665	537	36	92	240.00	
Jasper	71	56	2	13	30.00	
Jefferson	14	14				
Johnson	13	11	1	1		
Laclede	13	13				
Lafayette	19	17		2	15.00	
Lewis-Clark-Scotland	5	5				75.00
Lincoln	5	4		1		
Linn	9	7	1	1		
Marion-Ralls	31	24	1	6		
Mercer	7	5	1	1		60.00
Miller	3	3				45.00
Mineral Area (St. Francois-Iron-Madison-Washington-Reynolds-St. Genevieve)	40	36		4		
Mississippi	8	6	1	1	15.00	
Moniteau	7	6		1		75.00
Montgomery	4	4				
Morgan	4	2	2			
New Madrid	11	11			45.00	
Newton	12	12				
Nodaway-Atchison-Gentry-Worth	24	23	1		30 00	
North Central (Adair-Schuyler-Knox-Sullivan-Putnam)	22	20		2		120.00

Make Reservations Early

HOTEL RESERVATIONS

for

93rd Annual Session, Kansas City
April 22, 23, 24, 25, 1951

Members are requested to make reservations directly with the hotel of their choice.

President Hotel, 14th and Baltimore
(Headquarters, Missouri State Medical Association)
Single room $4.00 to $6.00; double $6.00 to $8.00, twin bedded room $7.50 to $12.00.

Muehlebach Hotel, 12th and Baltimore
Single room $4.00 to $6.00; double $6.00 to $8.00; twin bedded room $7.50 to $12.00.

Ambassador Hotel, Broadway and Knickerbocker
Single room $3.00 to $5.00; double $3.50 to $6.00; twin bedded room $3.00 to $6.00.

Bellerive Hotel, 214 E. Armour
Single room $4.50 to $7.00; double $7.00 to $10.00; twin bedded room $8.00 to $11.00.

Commonwealth Hotel, 11th and Baltimore
Single room $3.00 to $5.00; double $4.50 to $7.50; twin bedded room $6.00 to $8.00.

Continental Hotel, 11th and Baltimore
Single room $3.50 to $6.00; double $6.00 to $9.00; twin bedded room $7.00 to $9.00.

Phillips Hotel, 12th and Baltimore
Single room $4.00 to $7.00; double $5.50 to $9.00; twin bedded room $8.00 to $10.00.

Pickwick Hotel, 10th and McGee
Single room $3.25 to $5.00; double $4.75 to $7.00; twin bedded room $5.50 to $7.00.

Ozark Medical Society (Barry-Lawrence-Stone-Christian-Taney)	35	31		4	15.00	
Pemiscot	16	15		1		
Perry	7	7				75.00
Perry						15.00N
Pettis	32	26		6		
Phelps-Crawford-Dent-Pulaski	30	26	1	3	15.00	
Pike	13	7	2	4		
Platte	8	6	2			
Ray	7	4	1	2	15.00	
St. Charles	23	21	1	1	15.00	
St. Louis County	307	264	25	18	30.00	30.00
St. Louis County						37.50N
St. Louis Medical Society	1,287	1,068	140	77	472.50	247.50N
Saline	22	21	1		45.00	
Scott	16	16				
Shelby	4	3	1			
South Central (Howell-Oregon-Texas-Wright-Douglas)	19	16	1	2		
Stoddard	6	6				
Vernon-Cedar	16	14		2		
Webster	3	3				45.00
Totals	3,548	2,969	249	330	$1,087.50*	$1,410.00

* Delinquent 1950 dues of members carried at December 31, 1950 at the request of local societies.

(N) New members—payments received from applicants in 1950 for memberships effective January 1, 1951.

Budget for 1950

Salaries	$29,000.00
Journal Expense	20,000.00
Postage and Express	500.00
Printing and Stationery	1,800.00
Travel, Executive Secretary	900.00
Travel, Field Secretary	1,500.00
Telephone and Telegraph	1,200.00
Office Rent and Light	3,000.00
Meeting and Committee Expense	12,000.00
Defense	500.00
Scientific and Postgraduate Work	1,000.00
Woman's Auxiliary	500.00
Public Relations	4,500.00
Insurance Annuity	950.00
Miscellaneous and General Expense	1,500.00
Furniture and Fixtures	250.00
Social Security Tax	425.00
Total	$79,925.00

SOCIETY PROCEEDINGS

FIRST COUNCILOR DISTRICT

DONALD M. DOWELL, CHILLICOTHE, COUNCILOR

Thirty physicians from Caldwell-Livingston, Carroll, Clinton, Grundy-Daviess, Harrison, Linn, Mercer and Ray County Medical societies attended a medical dinner meeting at the Strand Hotel, Chillicothe, Thursday evening, March 1.

Following a fine dinner an interesting program was presented as follows: Claude J. Hunt, M.D., Kansas City, spoke on "The Management of Acute Bowel Obstruction." Roland M. Klemme, M.D., St. Louis, discussed "Pain—How to Handle It."

Another meeting of this group is planned for early June.

SECOND COUNCILOR DISTRICT

W. F. FRANCKA, HANNIBAL, COUNCILOR

Chariton-Macon-Monroe-Randolph County Medical Society

The Chariton-Macon-Monroe-Randolph County Medical Society met at the Woodland Hospital, Moberly, January 11.

Melvin A. Casberg, M.D., St. Louis, spoke on "Treatment of Stomach Ulcer" and Leo V. Mulligan, M.D., St. Louis, described "Recent Work on Liver Cirrhosis."

Wallace S. Petty, M.D., was made a member by transfer from Nebraska.

Members present were Drs. P. V. Dreyer, A. P. Rowlette, F. L. McCormick, R. H. Young, H. E. Allen, G. W. Hawkins, F. A. Barnett, C. C. Smith, C. C. Weger, F. L. Harms, Wallace S. Petty, J. Will Fleming, Jr., G. C. Rice, W. D. Chute, T. S. Fleming, H. K. Baker and R. W. Smith.

Henry K. Baker, M.D., Secretary.

The Chariton-Macon-Monroe-Randolph County Medical Society served as host to an evening dinner meeting of the Second Councilor District of the State Medical Association at the Merchants Hotel in Moberly, on Thursday, March 8. The evening festivities began with a social hour at 5:30 p. m. followed by dinner at 7:00 p. m. and the following program:

Stanley F. Hampton, M.D., St. Louis, spoke on "Practical Points in the Management of Allergic Conditions." Llewellyn Sale, Jr., M.D., St. Louis, spoke on "Recent Advances in Drug Therapy."

Fifty-two physicians from the Second District and adjoining counties were in attendance at this most pleasurable and worth-while meeting.

EIGHTH COUNCILOR DISTRICT

W. S. SEWELL, SPRINGFIELD, COUNCILOR

Eighty physicians from Southwestern Missouri attended an evening dinner meeting of the Eighth Councilor District at Wilder's Cafe, Joplin, on February 22, with the Jasper County Medical Society as genial hosts. Those in attendance enjoyed a relaxing social hour beginning at 6:00 p. m., dinner at 7:15 p. m., and then the program as follows:

Victor B. Buhler, M.D., Kansas City, discussed "Blood Transfusions and Transfusion Reactions." Rex L. Diveley, M.D., Kansas City, spoke on "Backache."

An unusual amount of interest was shown in this program.

NINTH COUNCILOR DISTRICT

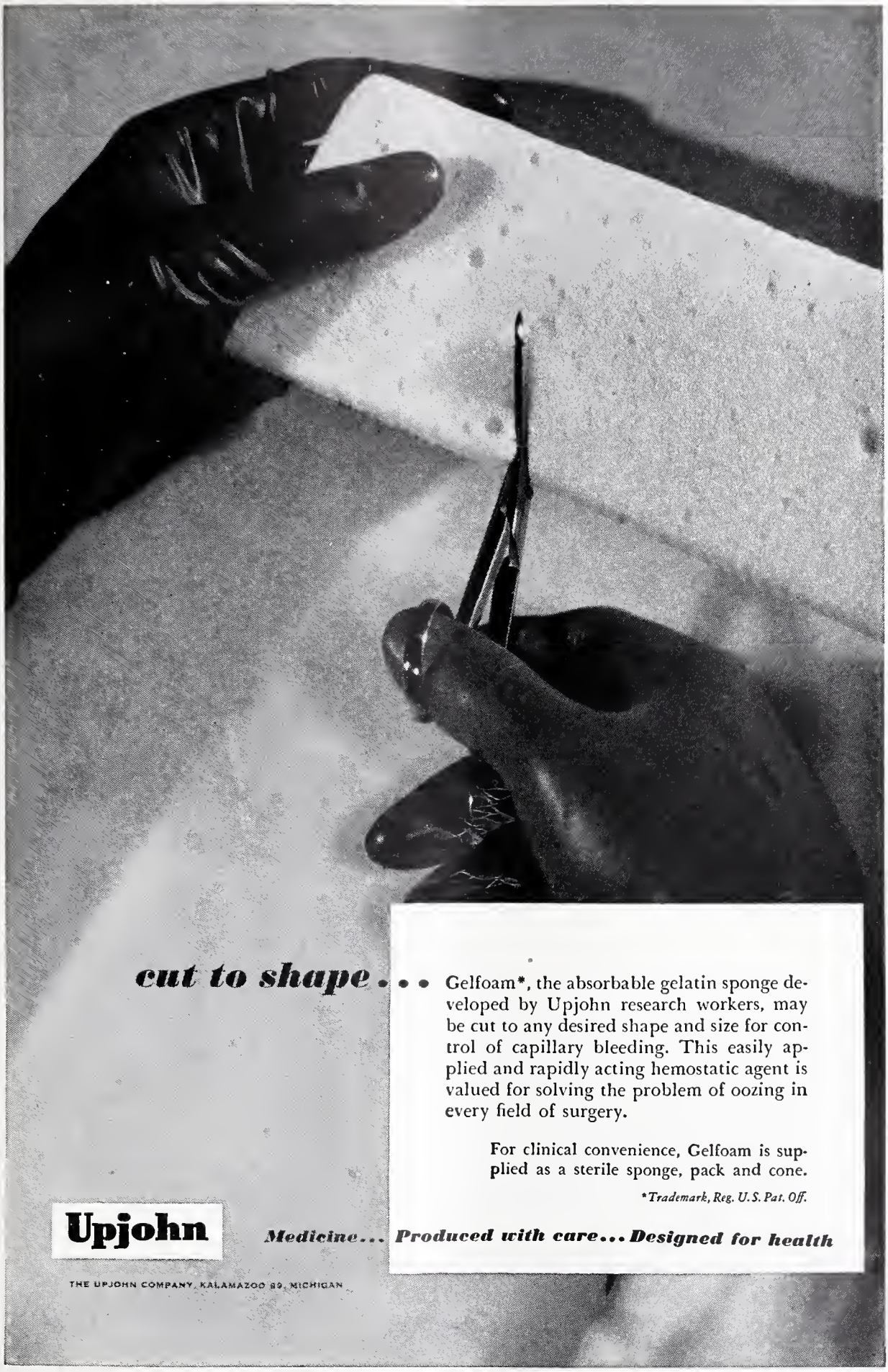
E. C. BOHRER, WEST PLAINS, COUNCILOR

A meeting of the Ninth Councilor District was held March 1 at the Edwin Long Hotel, Rolla. The Councilor of the District, E. C. Bohrer, M.D., West Plains, presided. A social hour beginning at 5:30 p. m. preceded the dinner meeting.

Following dinner a scientific program under the auspices of the Cardiovascular Section of the St. Louis University School of Medicine was presented, as follows:

Charles J. Kromer, M.D., St. Louis, "Pathogenesis of Congestive Heart Disease."

Burch V. Raley, M.D., St. Louis, "Physical Findings and Differential Diagnosis of Congestive Heart Failure."



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James P. Murphy, M.D., St. Louis, "Treatment of Congestive Heart Failure."

The program was well received by the forty-five persons who attended.

South Central Counties Medical Society

The South Central Counties Medical Society met at the Elliott Hotel, Mountain Grove, February 21, with the following present: Drs. R. W. Denney, S. W. Connor and A. C. Ames, Mountain Grove; Garrett Hogg, Jr., Cabool; T. J. Burns and S. G. Kramer, Houston; M. B. Perkins, Willow Springs; E. C. Bohrer, Rollin H. Smith and C. F. Callihan, West Plains; W. W. Tilman and G. Bruce Lemmon, Springfield.

A. T. Walker, M.D., Mannouth Spring, Arkansas, was voted a member of the Society.

Dr. Tilman spoke on "Antibiotics" and Dr. Lemmon discussed "ACTH and Cortisone." Dr. Burns expressed the thanks of the Society.

The meeting adjourned to convene in Cabool on March 1.

A. C. Ames, M.D., Secretary.

MISSOURI STATE MEDICAL SECRETARIES AND ASSISTANTS CLUB

The Jackson County Medical Secretaries and Assistants Club extends a cordial invitation to assistants, secretaries, technicians and nurses to attend a meeting to be held in Kansas City at the same time as the Missouri State Medical Association. Anyone employed full time for at least a year by a physician in good standing in the Missouri State Medical Association will be welcomed. The purpose of this meeting is to organize a Missouri State Medical Secretaries and Assistants Club. Sessions of the Association will be open to those attending.

A brunch is planned for Sunday, April 22, and a business meeting with election of officers will be held Monday afternoon, April 23. Of necessity plans will be made only for those making reservations. Anyone interested is asked to write Nita C. Fabac, Chairman, Special Projects Committee, Jackson County Medical Secretaries and Assistants Club, 107 West Linwood, Kansas City 2.

BOOK REVIEW

A Monograph on Sucking Habits (Thumb, Finger, and Hand Sucking). By Paul J. Mandabach, Sr.

The author has made an extensive survey of medical, dental, and consumer literature on thumb sucking, following which he published a monograph in the hope that children will not be faced with the ordeal of malocclusion. Copies may be obtained free of charge by writing the author at 677 N. Michigan Ave., Chicago 11, Ill.

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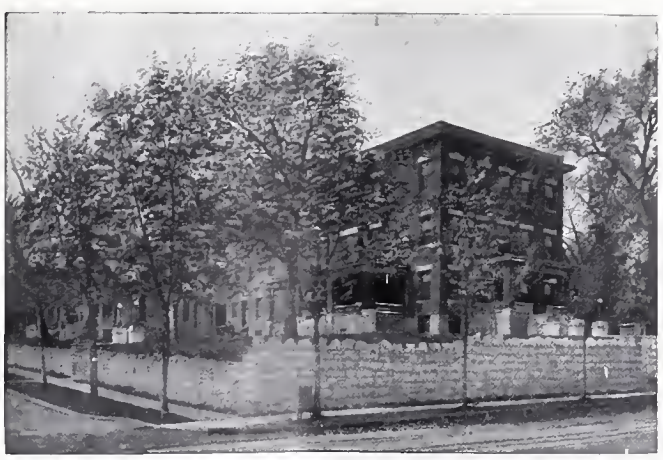
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(1) Mann, G. V., and Stare, F. J.: Nutritional Needs in Illness and Disease, J.A.M.A. *142*:409 (Feb. 11) 1950.

(2) Stieglitz, E. J.: Hypertensive Arterial Disease and Hypotension, Chapter 30, Geriatric Medicine, The Care of the Aging and the Aged, 2nd ed., Philadelphia, W. B. Saunders Company, 1949.

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2. *Upham, R., and Chaikin, N. W.: Rev. Gastroenterol. 10:287, 1943.*
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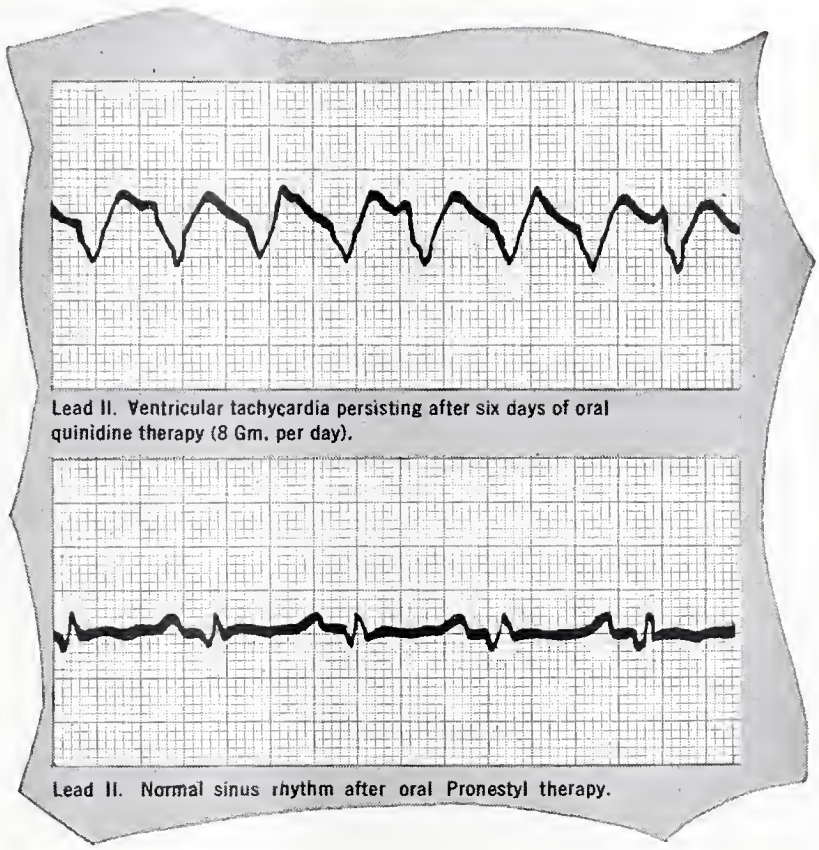
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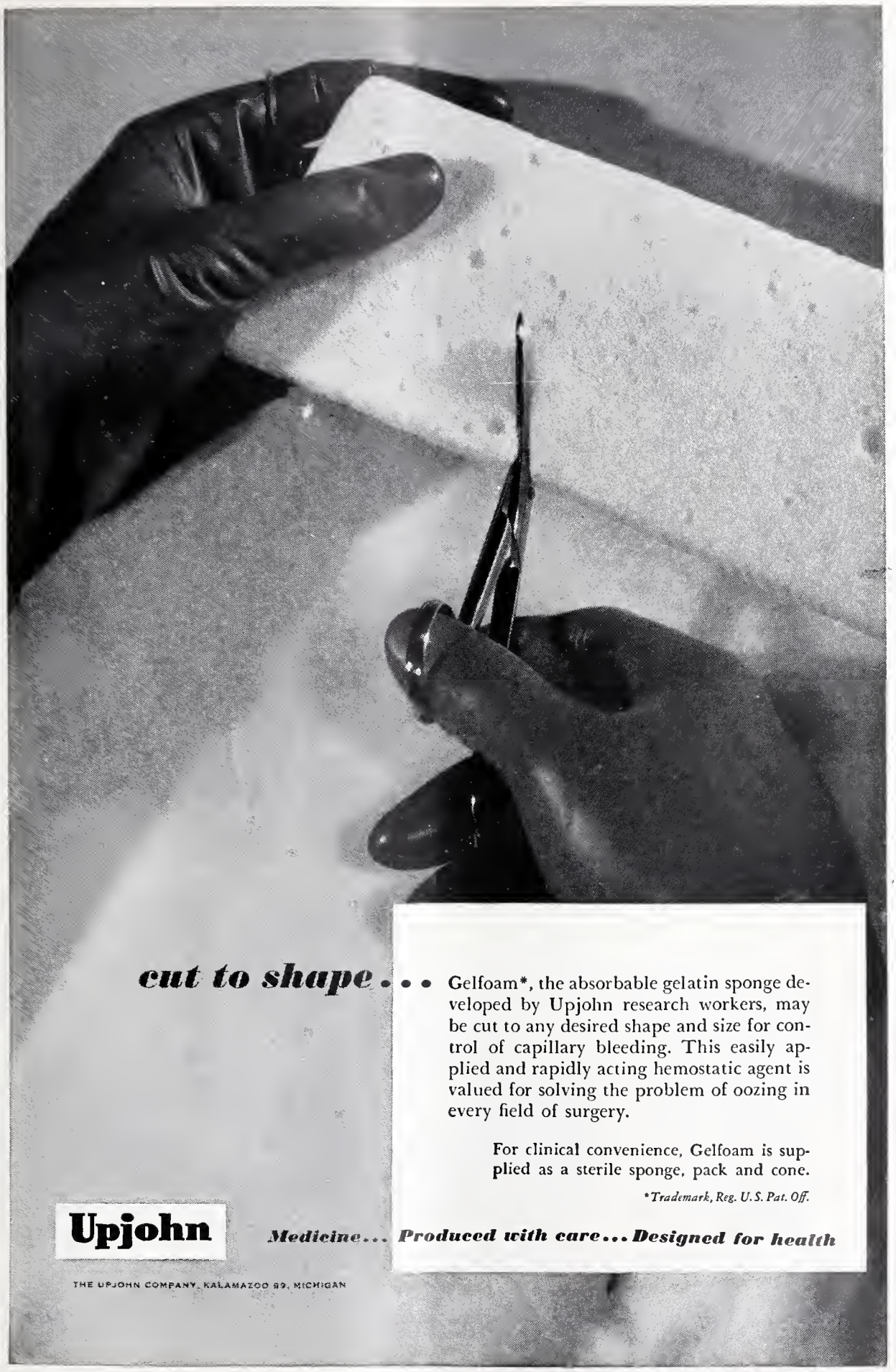
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Scientific Articles

THE PRIMARY SUTURE OF COLOSTOMIES

RUSSELL J. CRIDER, M.D.
ST. CHARLES
AND
B. L. NEUBEISER, M.D.
ST. CHARLES

THE PROBLEM created by the scarring, stenosis, bleeding and prolapse which occasionally result from an obstructive colostomy led to the development of a technic which would prevent these troublesome complications. Experience with this procedure has been so uniformly gratifying that a report appears justified. This method was first employed by F. Louis Knotts and one of us (R.J.C.) while on the surgical service of Barnes Hospital, St. Louis, in 1947.

The deficiencies of the old type of obstructive colostomy as usually practiced are so well known that discussion is not necessary. It is our opinion that a basic principle of primary healing is violated by the usual technic.

The accurate apposition of epithelium to epithelium has long been known to give less scarring. The colostomy is no exception. It is an artificial fistula. The maintenance of any fistula requires the healing together of epithelium to epithelium or, in the case of colostomy, mucosa of the colon to skin. An area of scarring between the two will eventually lead to stenosis (fig. 1). When the colon is allowed to protrude from one to two inches until scar formation retracts it to the skin level, a large circular scar develops which is the first step to later stenosis. The opinion held by some that a slight stenosis gives better colostomy control is not true. Prolapse or herniation are a usual result of the straining which accompanies the effort to evacuate the colon. The musculature of the abdominal wall provides the only adequate control. The stenosis in the old type colostomy is almost entirely superficial.

With present day methods of preparation, the fear of infection which prompted the use of the obstructive type of colostomy has vanished. Infection has not been a problem in our series of twelve cases in which we have employed the newer method.

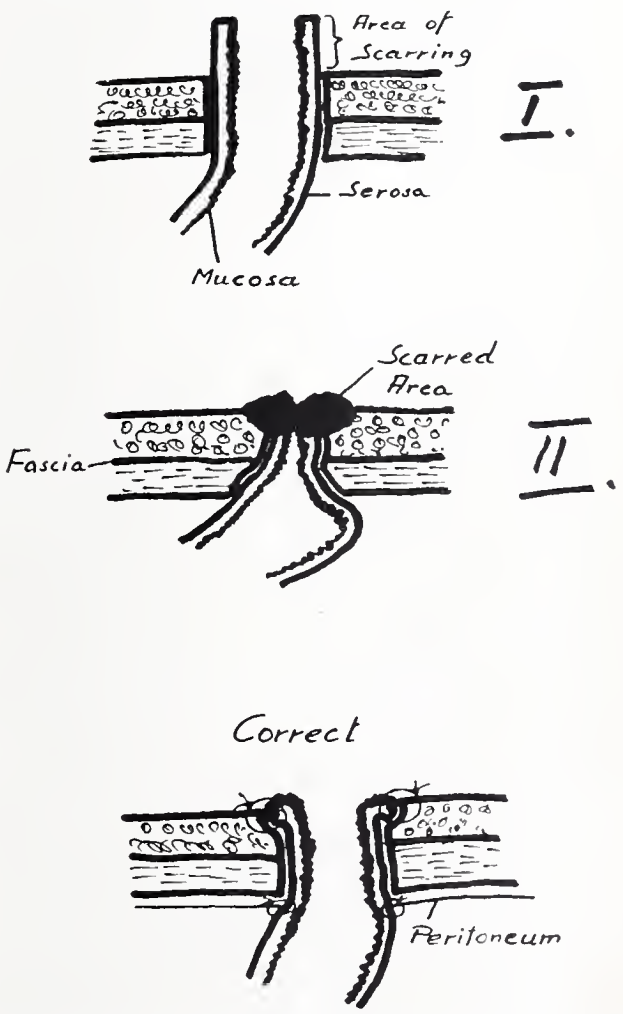


Fig. 1. The diagrammatic representation indicates the process (I and II) which leads to scarring and stenosis in the obstructive type of colostomy. The lowest figure is a diagram of the correct method of colostomy suture for primary healing.

From the Departments of Surgery, Barnes Hospital, St. Louis, and St. Josephs Hospital, St. Charles.

Since this report was submitted, three totally unprepared obstructed patients were subjected to primary colostomy suture. Primary healing without infection occurred in each instance.

TECHNIC

Selection of the Colostomy Site.—Both inguinal and incisional colostomies have been used. It seems to make little difference and there has been no unusual reaction in the operative wound in any case. The colostomy should not be too near the anterior superior spine and it should not be too low in the inguinal region. The most satisfactory site in our experience is approximately half way between

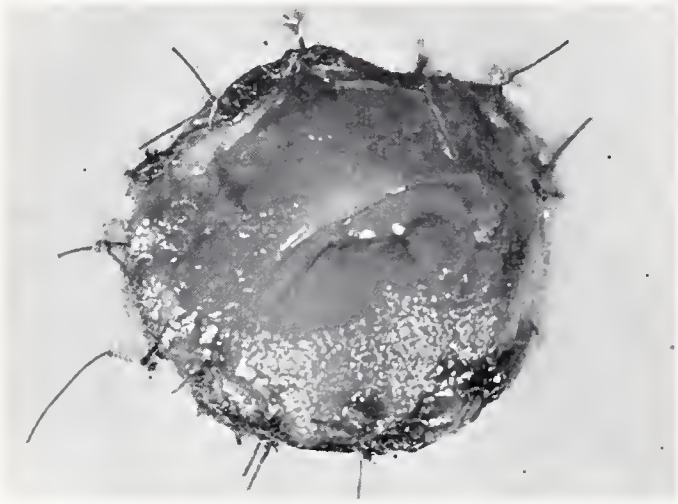


Fig. 2. This photograph was taken on the second postoperative day. Note the absence of inflammatory reaction and edema.

the anterior superior spine and the umbilicus, that is, for a sigmoid colostomy.

Preparation of Site.—The following basic principles should be followed whether a terminal or double barreled, incisional or inguinal colostomy is to be used. The colon should remain closed during the preparation of the site in order to prevent unnecessary contamination.

An ellipse of skin should be removed from the colostomy site creating a circular opening approximately 4 cm. in diameter. This is adequate for a terminal colostomy. A double barreled colostomy may require a slightly larger opening (fig. 3). A corresponding portion of the subcutaneous tissue should also be removed. A cross incision 4 cm. long and 2 cm. wide in the fascia of the external oblique muscle usually will be adequate. Loose tags of fascia are then removed. An incision 5 cm. long is made in the direction of the fibers of the internal oblique muscle. No cross incision is made. Muscular control of the colostomy is enhanced by the oblong opening which results. The transversalis muscle and the peritoneum are then incised in the same plane and for approximately the same distance. The operative wound is left open to facilitate this procedure.

The Colostomy.—The colon is brought through the prepared opening until approximately 2 cm. are above the level of the skin without tension. With the colon in this position, and without tension on the mesentery, the lateral defect along the gutter is closed to prevent internal herniation lateral to the colon. Care should be exercised not to interfere with the blood supply of the colon when its mesentery is sutured to the parietal peritoneum. In the incisional type of colostomy this need not be done.

The peritoneum is sutured to the colon with atraumatic catgut. This is best accomplished at the mesenteric border and at the tenia of the colon. Other sutures may be necessary. The mucosa of the colon should not be penetrated.

With the colon protected, the operative incision is closed completely. Fine mesh gauze impregnated with vaseline plus several dry gauze flats form an adequate dressing. The colon is opened and the injured edges (if a clamp is used) are excised. The redundant portion of the colon is gently placed subcutaneously. The mucosa is accurately sutured to the skin edge with interrupted fine silk sutures. This should be done carefully since poor apposition will create areas of scarring which could defeat the purpose of the procedure.

Postoperative Care.—The patients are usually comfortable postoperatively. There is no obstruction to the colon. As soon as the postoperative paralytic ileus has subsided, gas passes freely. This eliminates the gas pains which so frequently are encountered in the obstructive type of colostomy. Dressings are changed as needed. It is our experience that it is rarely necessary to change them frequently unless the patient had obstruction and was not well prepared before operation. It is not desirable to operate in the face of colon obstruction although it is sometimes necessary. If care is exercised, this technic of colostomy will permit rapid colon decompression. This, of course, is the desired aim.



Fig. 3. This photograph of a double barreled, defunctioning colostomy was made on the tenth postoperative day. The sutures have not been removed from the incision. Little reaction is present.

Other elements in postoperative care should include adequate transfusions, antibiotics, chemotherapy, vitamins and fluids as indicated and desired. We have found it unnecessary to continue to sterilize the bowel postoperatively. The colostomy sutures should be removed as early as the

fifth postoperative day or reaction about the sutures will occur.

In our experience a daily enema given at a specific time of the day is a most satisfactory method of colostomy care. This should be administered by the patient himself. A small pad of Kleenex worn



Fig. 4. The well healed colostomy, photographed several months after operation, is a good example of the satisfactory stoma which is obtained following primary healing.

on the inside of a 10 cm. square of cellophane or plastic and a wide elastic belt are the only appliances necessary.

RESULTS

This technic of colostomy has been performed on twelve patients. Eight of the patients were subjected to combined abdominoperineal resections for carcinoma of the rectum. In four of the patients, defunctioning colostomies were done. Follow up studies range from two months in a patient with metastatic carcinoma to three years. In no instance in this series has stenosis of the colostomy been noted. Follow up notes on each patient indicate that control is satisfactory and function is good.

The patients were prepared preoperatively with sulfasuxadine, blood replacement, vitamins and saline enemas.

Advantages.—The following advantages of the new technic over the old obstructive colostomy have been noted:

1. A smoother postoperative course.
2. More rapid decompression of the colon postoperatively.
3. Decreased number of dressings.
4. Rapid convalescence with a shorter hospital stay.
5. A more satisfactory and more easily cared for colostomy results.
6. Fewer colostomy complications such as bleeding, stenosis, prolapse and herniation.

SUMMARY

A technic of primary colostomy suture at the time of operation is described. More rapid decompression, primary healing and fewer colostomy complications result.

THE ROLE OF EDEMA IN CLINICAL GYNECOLOGY

GERALD L. MILLER, M.D.
KANSAS CITY

DESPITE THE diminishing incidence of pelvic inflammatory disease there remains an increasingly more common problem of pelvic pain. This is not fully accounted for by an increasing astuteness in the diagnosis of endometriosis and pelvic neoplasm. This pelvic distress which is of a rather bizarre character commonly has been associated with other reproductive system painful aberrations, namely, painful breasts and premenstrual tension. This picture makes it worth while to attempt a clearer understanding of the "functionally painful pelvis" and its related distressing manifestations in the reproductive tract.

The European and American literature has been voluminous on this subject during the last sixty or seventy years. This recently has been studied and correlated by Taylor with his further contribution of the "Congestive Hyperemia Fibrosis Syndrome" but despite its excellence, completeness and thoroughness his study seems to be basically inconsistent due to his effort to explain the entire picture singularly on the basis of vascular congestion. This inconsistency prompted the title of this paper which, for the most part, is to be confined to the role of extracellular extravasations, namely, fluid, its production and its likely contribution to the cause of functional reproductive system pain.

It should be noted that previous authors, particularly from the French school, have stressed the importance of this vascular congestion and edema as an important factor in the production of pain. In addition, an inflammatory phase of the picture was stressed by German authors with the use of the term "parametritis postica."

Obviously, then, the subject is not new. Perhaps a few of my thoughts will be different; I am sure many will provoke controversy. It is my hope that this paper may stimulate further thinking and further contributions to this common and difficult problem for I am certain that this picture is occurring more and more frequently and paralleling the speed of American living and concomitant social instability. By the same token, because of the complexity of the problem, mismanagement is common and unnecessary operative intervention is astonishingly frequent.

No attempt is to be made to prove or disprove that abnormal excessive accumulations of extravascular or extracellular fluid can or will produce pain. Under certain circumstances this fact must be accepted since much of the pain and discomfort of local inflammatory lesions is established as being due to the abnormal extravasation of fluid, either lymphatic or vascular, rather than to exudate, toxins or release of histamine. The common evening leg discomfort noted by those whose occupation demands that they be on their feet

Presented before a meeting of the Kansas City Obstetrical and Gynecological Society, March 9, 1950.

long hours daily is due to an increased extracellular fluid and this is not necessarily congestive in origin. The occurrence of edema of particular types, namely, that of angioneurotic edema is associated with pain. The degree of discomfort is a matter dependent somewhat upon the location and acuity. More distress is associated with edema in sensitive structures such as mucous membrane, peritoneum and the reproductive system. Hypersensitivity of an individual also plays a part in the amount of incapacity noted from this extravasation.

It is extremely difficult to associate symptoms resulting from vascular congestion on a systemic basis. The breasts and pelvis are commonly the seat of pain concomitantly as has been pointed out by Taylor and others; yet there is an atypical or faulty structure of the veins of the pelvis, but no such atypical venous structure of the breasts exists. In the breasts with premenstrual distress there may be occasional ductile dilatation and epithelial hyperplasia, but nearly always there is excessive extracellular fluid. It does not seem proper to associate the two clinical pictures commonly seen together with a singular vascular phenomenon, especially since the venous system of the pelvis is atypical with its paucity of valves and that of the breast is apparently much like that noted elsewhere in the body. Although the entire pelvic venous system has a complex anastamosis, Taylor has stated that symptoms involving large bowel and bladder are fairly common in this syndrome, but he has not noted a high incidence of a more common venous static lesion such as hemorrhoids in functional pelvic pain.

It is certainly true that the casual gynecologic surgeon has not uncommonly opened an abdomen for pelvic surgery for reasons other than pain and, even with the patient in a recumbent position, has observed marked venous engorgement and congestion. Broad ligament varicosities and their relation to pain have long been a subject of debate. In 1915 Pinkham wrote of the pelvic varicocele and related it to childbearing and constipation. Though there is no unanimity of opinion, modern day gynecologists tend to minimize the importance of pelvic varicosities.

These are only a few factors, yet they are sufficient to produce doubt that simply a disturbed vascular pattern or hyperemia is the prime factor in functional reproductive system pain. A careful survey of the histopathologic picture of the ovary, uterus, cervix, vagina, uterosacrals and breast will reveal the regular appearance of extracellular edema. Previous authors have referred casually to its presence. Actually, it would appear to be the classical part of the picture.

PHYSIOLOGY OF EDEMA

Best and Taylor indicated that edema is a term applied to an excessive accumulation of fluid in the tissues which is due to the disturbance in the mechanism of fluid interchange. The factors of the mechanism are not always clear, and a satisfactory explanation of all forms of edema cannot be given, but it is evident that edema may arise from (1) reduction in the osmotic pressure of plasma, that is, protein concentration (nutritional); (2) general or localized changes in capillary blood pressure; (3) increased permeability of the capillary membranes, and (4) obstruction of the lymph channels through infection. Further, there is a tendency for edema to reach a certain degree and become stationary provided the conditions remain constant.

For further clarification, the work of J. L. Gamble, of Harvard Medical School, on "Extracellular Fluid" is noteworthy. I quote from him: "Extracellular fluid is composed of blood and interstitial fluid including lymph which lies between the vascular compartment and the tissue cell. Actually considered, extracellular fluid is a particular clear cut entity. Its physiologic role is as evident as that of the nervous system. Extracellular fluid constitutes, as Claude Bernard appreciated, the immediate environment of the organism. This aqueous media which surrounds the tissue cells is a vehicle of transport of nutrient and waste material. Besides this simple service, it provides stability of physiochemical conditions such as reaction in terms of hydrogen ion concentrations, osmotic pressure and temperature. The values for these properties of cell fluid rest on the value in which they are held in the surrounding media; successful operation of the vital processes requires approximate constancy. Total quantities of extracellular fluid is about 50 per cent of body weight; 25 per cent lies in the vascular compartment and 75 per cent in the interstitial space. The volume of fluid in the tissue cells of the body is approximately 50 per cent of body weight. The role of constancy of exchange with extreme varied demands is then a very complex and delicate mechanism."

It seems, then, reasonable to believe that minor changes in metabolism and nutrition and minor changes in mechanical factors and other related phenomena can enter tremendously into the production of edema and its resultant symptomatology, particularly in estrogen sensitized tissues which exhibit great flux in water retention. The acuity of edema and its faulty regression seems the likely reason for symptoms in this picture. The entire disturbance in physiology, however, remains obscure.

HYPOTHESIS OR CONCEPT

With the selectivity of this symptomatology and the occurrence predominately in the reproductive age or period of active ovarian function, certain contributions to the problem seem rational.

The occurrence of pain in estrogen sensitized tissues of the reproductive system seems dependent upon the intermittently abnormal extravasation of fluid in a highly sensitive individual with altered regression, and is further related to the estrogen threshold of the individual, plus another unknown

precipitating factor which is under the control of or intimately related to the automatic nervous system. This unknown factor may be altered by disturbances in metabolism, nutrition electrolysis and conceivably can be altered by such things as stress and infection.

CLINICAL PICTURE

The problem then is that of functional periodic pain and distress in menstruating or endocrine active women.

The acute phase shows dysmenorrhea or intermenstrual pelvic pain, commonly involving the entire lower abdomen. This pain may be unilateral or bilateral and commonly is suprapubic. There usually is associated low back distress and dyspareunia is present. All distress tends to be more severe premenstrually.

Cyclic breast pain (mastodynia) frequently has been associated with functional pelvic pain and premenstrual tension. It may be unilateral or bilateral and is usually associated with increased turgidity of the breasts. This symptom is more evident premenstrually.

Menstrual migraine has been an integral part of the picture and, though on occasion it has responded to empiric or symptomatic therapy, it has been predominately associated with the neurotic or psychiatric aspects of the problem.

Premenstrual tension is perhaps the most classical phase of the picture, having been reported in as high as 30 per cent of reported surveys. There is usually anxiety, instability, nervousness, depression and occasionally some psychotic trends.

Painful endometriosis is included because of the difficult problem it presents in differential diagnosis and the feeling that painful endometriosis may well be associated with this disturbance.

Over a period of time without regression this picture undergoes a metamorphosis to a more disabling chronic phase. In this phase the pelvic pain becomes persistent and more severe. There are associated bladder and bowel symptoms, namely, urgency, frequency and constipation with occasional periods of alternating diarrhea. The headaches are relatively chronic and are band-like or occipital. Chronic tension is a particularly disabling symptom. It is commonly associated with headache, sleeplessness and anorexia. Excessive smoking, be it significant or not, is a common observation. Mastopathy is chronic with structural changes apparent in the breasts. This repeatedly is the source of an innate fear of cancer and, because of this fear, is doubly distressing. Fatigue is profound.

Certainly at this stage incapacity is great and prognosis is poor unless the patient is entering the climacteric or her age justifies consideration of castration. Though fibrosis has been suggested as an end point pathologically and has been observed in certain instances, it hardly logically completes the picture.

The physical picture should bear repetition. There is nearly always some degree of anxiety and tension. Other evidences of autonomic nervous system instability are apparent such as moist, clammy hands and excessive perspiration.

Malnutrition is not uncommon; however an occasional obesity problem exists. Nearly always there is irrevocable clinical or historical evidence of disturbed nutrition and faulty eating habits.

Poor tissue tone is usually evident. Other evidences of altered metabolism such as dry skin and hair and brittle nails are common.

Exquisitely tender breasts, particularly in the premenstrual phase, are noted. If the process is of relatively long standing vermiform nodularity exists in one or both breasts.

The pelvis possibly presents the most characteristic picture. The cervix is usually cyanotic, edematous and excessive mucoid discharge is apparent. The uterus is tender and in the parturient woman often enlarged; there may be decensus but position of the freely movable uterus does not seem to be important, but the commonly reported 33 per cent retrodisplacement will be observed.

The parametria is diffusely tender and, if long standing, indurated, band-like uterosacral ligaments will be detected. The adnexae are tender and one or both frequently are enlarged.

Other anatomic disturbances such as decensus, cystocele, urethrocele and enterocele are noted with their special symptoms in addition to those dealt with in this discussion.

FACTORS INVOLVED

The systemic nature of the manifestations of this syndrome and the ineffective results with various suggested methods of therapy would strongly suggest a multiplicity of factors, local and general, as etiologic factors in this disturbing picture. The potential factors, local and general, are: (1) psychosomatic, (2) endocrine, (3) sensitivity, (4) metabolic, (5) electrolytic, (6) nutritional, (7) vascular, (8) mechanical, (9) infectious.

1. *Psychosomatic.*—What part psychosomatic factors play in this problem is extremely difficult to evaluate. Most of these patients, either primarily or secondarily, have low thresholds of pain, severe anxiety and minor manifestations of the adaptation syndrome. The indirect effect of these psychosomatic factors on the hypothalamus and subsequently water metabolism and the rest of the autonomic nervous system have been discussed in the literature extensively. Attempts at therapy through the autonomic nervous system have met with only moderate success and have been approached with a severing of sensory fibers in mind, probably ignoring the over all systemic factors involved. As to the production of reproductive system edema one is initially skeptical; however, autonomic nervous system manifestations may commonly result through the vascular tree in abnormal extravasations of fluid and, more remotely, instances of selective edema reportedly have been provoked by psychic shock and trauma. Suffice it to say, further

clarification regarding the autonomic nervous system and its relationship to this problem is needed. The existence of extremely frequent psychosomatic trends is accepted.

2. *Endocrine.*—The endocrine factors are undeniably important in that functional disturbances of the reproductive system are essentially nonexistent except during the reproductive age of woman. This, nonetheless, has only served to confuse those who have attempted to study this problem both pathologically and from the standpoint of therapeutics. The literature is replete with various panaceas for menstrual mastodynia, premenstrual tension and for the various painful pelvic aberrations. Most of these exploited therapies are endocrine. None have stood the test of time. This in no way, however, can minimize the importance of the endocrine system and its contribution to these bizarre symptoms. Frank has suggested the use of androgen for premenstrual tension; others have voiced their enthusiasm for the use of estrogens and other endocrine preparations, most commonly for the treatment of functional painful breasts and premenstrual tension. It seems more important, however, that one take cognizance of the work of Astwood, Carroll and others for they have demonstrated the ability of the estrogen sensitized reproductive organs to imbibe fluid extracellularly. It seems probable that herein lies an extremely important factor in the development of these functional disturbances, where the ability of the estrogen sensitized organs of the reproductive system are disturbed in this imbibation and mobilization of extracellular fluid. The androgens apparently have been of value in minimizing fluid content of estrogen sensitized tissues, but further study is necessary to establish the true normal relationship. The adrenals unquestionably have bearing in this problem, somewhat through their control of blood electrolytes, and further through the reciprocal relationship with the other endocrine glands and the hypothalamus. Soffer has contributed most to this particular study.

3. *Sensitivity.*—In 1914 Osler indicated multiple causes of local edema, petechia and purpura and stated that the causes are wrapped up in infection or metabolism but all are manifestations of a supersensitiveness. He felt that an anaphylaxis was the probable key to the answer. Numerous writers have felt strongly that the profound peritoneal edema and peritoneal transudate associated with functional disturbances of the pelvis were allergic in origin. More recently nicotine sensitivity and its effects upon the vascular tree have been demonstrated. Certainly it behooves one to assume that increased sensitivity of tissues must assume an important role in the development of this disturbed psysiologic phenomena.

4. *Metabolism.*—Metabolism without question enters both directly and indirectly into this problem. Obviously many factors considered and to be considered are metabolism related. My concern at this time is, however, regarding the effect of hyperthyroid and hypothryoid states and their relation to this problem. It is my feeling that hypometabolism is observed frequently in this type of patient. Certainly this in part may have much to do with the subjective symptomatology of fatigue, nervousness and irritability. It is also quite likely that this is related to hyperestrogenism. Furthermore, associated circulatory disturbances are common and sludging and increased venous stasis are noted frequently. The common alleviation of peripheral edema by adequate thyroid therapy in the patient with renal, cardiac and vascular disease excluded is important.

5. *Electrolytic Balance.*—Electrolytic balance is extremely important in water metabolism and the production of edema. The work of Furstenberg in sodium ion control and water exchange in Meniere's symptom complex is monumental, and the subsequent importance of sodium ion control to gynecologists in the management of premenstrual tension and functional reproductive system pain is known to all.

6. *Nutrition.*—A consideration of the nutritional factors involved is perhaps a delicate one, particularly in relation to the production of selective edema with the subsequent production of pain. This is a systemic disturbance with predominant local manifestations, and present laboratory methods do not make it possible to detect such subclinical disturbances in blood protein content that may result in such fluctuations of the osmotic pressure sufficient to produce edema and distress. It is, however, important to note the rather frequent history of patients with disturbed eating habits, inadequate nutrition and the associated so-called functional gastrointestinal disturbances that are a part of this picture. So, with positive proof lacking, there is excellent supportive evidence which justifies noting the importance of nutrition as a common factor in this picture.

7. *Vascular Disturbances.*—The frequency with which vascular disturbances occur has been brought out previously in this paper and are most clearly evaluated by Taylor. One must accept the vascular component as a factor in the production of reproductive system pain, probably by virtue of excessive and abnormal extravasations of fluid as a result of disturbances in the capillary membrane.

8. Mechanical Factors.—Taylor has made particular issue of the atypical venous system of the pelvis with its paucity of valves and commonly weakened walls as the result of childbirth. There has been much mention of the greater frequency of pain with ovarian enlargement on the left side associated with the special anatomy of the left ovarian vein which enters the renal vein at an acute angle. These factors, by leading to vascular congestions, predispose to an increased transudation of fluid into the extracellular space due to local changes in capillary blood pressure and increased permeability of the capillary membranes. The upright position of woman predisposes to gravi-

tation which simply augments the potentiality of symptom production because of abnormal amounts of extracellular fluid in these tissues. These, because of their estrogen content, are cyclically overladen with extracellular fluid. Constipation has been a mechanical factor associated with increased pelvic distress. It is questionable, admittedly, at what point of severity this might truly result in edema. It is much more likely that it is simply an aggravating factor, by virtue of pelvic mass, producing additional pressure symptoms. The question of retrodisplacement is pertinent because the common operative procedure for such patients manifesting pelvic pain is some type of suspension. It seems unlikely that the freely movable uterus with its small bulk can be associated with the production of pain. However, fixed retroversions as a result of residues of pelvic infection may well be contributing factors to the symptomatology. Decensus with or without associated cystourethrocele and rectocele may be contributory because of parietal peritoneal irritation or by producing increased congestive phenomena. Chronic cystic mastitis and its associated intermenstrual and premenstrual discomfort has been shown occasionally to be subjectively improved by adequate support simply through alleviation of gravitation mechanical factors.

9. *Infection.*—Cervical infection on the basis of lymphatic blockage and occasionally lymphangitis and lymphadenitis is probably a focus of pelvic pain. Severe posterior parametritis with its classical induration and edema has reportedly been eradicated by the elimination of cervical infection. It has been my feeling, and I think adequately demonstrated, that other proximal infections of the pelvis, namely, bladder, urethra, vagina and rectum, may all be contributors to pelvic edema, pain and other functional disturbances.

TREATMENT

Empiric treatment in the past has been notably unsuccessful and shall doubtlessly continue to be so until a clearer understanding of the disturbed psysiology is revealed. Yet there must be a rational therapeutic approach to this problem based on the rational use of therapeutic agents now in vogue plus a careful evaluation of the patient. This is a medical problem, and in such a bizarre disturbance with its several manifestations and unsatisfactory response to therapy at present, it behooves one first to do no harm.

A satisfactory therapeutic regime is at present largely symptomatic, yet I feel it should include the following:

1. *Psychotherapeutic.*—This should include the elimination of abnormal stress, physical and mental, assistance in adjustment and adaptation, proper instruction in sex hygiene, reassurance and advice in change of environment if necessary.

2. *Sodium Ion Control.*—The Furstenberg regime, including salt restriction and the use of ammonium chloride in large doses of from 90 to 120 gr. daily through one or two menstrual cycles, has been advantageous.

3. *Metabolism.*—A check of the basal metabolic rate and blood cholesterol, though not good, represents the best investigation procedure. The proper use of thyroid to tolerance with its ability to raise blood pressure, pulse and metabolism has been empirically of tremendous value.

4. *Vitamin E.*—(Alpha tocopherol) has been used in doses of up to 300 mg. with reported good results. Its pharmocologic action is questionable; its use is empiric at best.

5. *Endocrine.*—The use of estrogen and androgen products in initial therapeutic survey seems unsound, but in refractory cases the employment of ovulation inhibiting doses of estrogens has been of value. This is presumable by virtue of the paradoxical action of estrogen and its pituitary inhibiting capacity when used in large doses. Androgens have had enthusiastic supporters but, on the basis of present knowledge, should be used as a last resort in the endocrine active woman.

6. *Postural.*—Correction of postural factors may seem somewhat psychotherapeutic, but the use of postural drainage of 15 to 20 minutes three times daily and the mechanical support of the painful breasts have been of impressive value to me. Correction of postural defects by exerise or support is a worth-while adjunct.

7. *Nutrition.*—Nutrition is included in this regime because of its importance as a supportive measure. Regularity of eating habits and a high caloric high protein dietary intake are important. The elimination of smoking as an aid to establishing a proper nutrition plus its questionable effect on the vascular tree seems sufficiently important to justify mention here.

8. *Castration.*—In the severely incapacitated preclimacteric individual who has not reponded, it seems rational to consider the value of castration by x-ray. Fortunately, this group will be small, and all other measures should first be given adequate trial. In many instances in which the disturbances are of long duration, regulation of the patient need be quite as exacting as that of the peptic ulcer or hypertensive patient. Unnecessary surgery is often a further crippling and incapacitating factor and rarely should be a part of the therapeutic regime.

SUMMARY AND COMMENT

A survey of the problem of functional reproductive system pain and its possible relation to disturbances in extracellular fluid balance has been made. A concept as to etiology of this symptom complex has been presented.

The presence of multiple related factors in the production of this painful and distressing physiology is impressive. Its occurrence in women who are endocrinologically active together with the common occurrence of excessive extracellular fluid at the site of distress strongly point to an altered estrogen threshold plus unusual sensitivity of tis-

sues and a disturbed autonomic nervous system as basic factors in the problem. Other potential factors involved have been presented and evaluated.

A conservative plan of medical management has been presented. Further understanding of the fundamental pathogenesis and disturbed physiology is necessary before specific therapy can be applied.

DISCUSSION

Russell Kerr, M.D., Kansas City: The problem Dr. Miller has discussed is one that is heard about in the hospital as a diagnostic problem to rule out major pathologic changes. This problem is one in which the diagnosis is not made by gross or microscopic tissue examination in most instances. Occasionally, such definite edema is present as to present a gross or microscopic picture easily diagnosable but those cases usually are due to one of the latter three causes he enumerated, namely, mechanical, vascular or infectious. Those are the most obvious.

The first five causes he mentioned, psychosomatic (so-called), (2) endocrine, (3) sensitivitity, (4) metabolic and (5) electrolytic, I believe should be classed under number 2, i.e., they are all on an endocrine basis. The only one in which there could be much doubt is the sensitivity, and I believe there is factual data to support that statement though I do not have it at hand.

The psychosomatic factor as he says is a minor manifestation of the adaptation syndrome which I think Dr. Selye has demonstrated adequately. It has a fundamental endocrine background related primarily to the pituitary and adrenals, but with those two main regulators of the endocrine system involved, it is only a matter of demonstrating that others may be involved. Also, it has been shown by Drs. Ledger and Wilson at the University of Kansas that these patients have an abnormal glucose tolerance curve, another part of the endocrine system abnormality in these so-called psychosomatic patients.

Metabolic changes, especially the hypothyroid state and its related tissue edema that are often discussed, I think are too seldom taken into consideration as certainly some of these people respond to thyroid therapy if proper dosage is determined. It helps the circulation, the fatiguability of the psychosomatic factor and probably helps the whole endocrine system.

The electrolytic factor, again I believe, is closely related to the endocrine system for Thom and Harrop in *Science* in 1937 report that crystaline estradiol, progesterone, estrone, pregnandiol, testosterone and testosterone properion acid, in the order mentioned, all have the ability to produce sodium and water retention and are associated with decreased urine output and gain in weight.

The pelvic organs show the most marked changes and show an increase up to 4.3 per cent of weight by increased fluid imbided as a result of these injections. Dr. Robert Moore at a recent meeting at Wichita said that in his and other's opinions the peritoneum of the pelvis was different from that of the celomic cavity and responded more to the changes in endocrine balance.

Danforth, Boger and Graff, from Columbia University, in *Endocrinology* in 1946 showed that the weight varies with the state of the menstrual cycle and as it goes up the hematocrit and blood total protein fall and vice versa.

Lois Day in *Surgical Clinics of North America* reports two cases with edema, especially premenstrual edema and with most of the symptoms described by Dr. Miller. They were thought to be cases of ovarian hypofunction and laboratory studies showed excessive amounts of prolan and decrease in estrogenic substances with resultant sodium and water retention. She says that estrogens, salt restriction and substitution with NH_4CL will help. She feels that all these cases have endocrine imbalance and ovarian hypofunction and divides them into five classes: (1) constitutionally inferior in genital apparatus, (2) cases in which trouble develops after a pelvic operation, (3) cases in which trouble develops after inflammatory process, (4) cases in which trouble follows pregnancy, (5) symptoms appear secondary to debilitating disease in other parts of of the body.

This is only a rambling review of some thinking about this problem which I think points to the importance of the endocrine problem. May I suggest that when one finds the way to strike a proper balance to the endocrine system he will solve a large number of these problems. It is too bad that at present the laboratory studies in diagnosing and managing these patients still remain almost a research problem because of time and cost of materials to perform the tests. One thing to strive for is a simple test for endocrine evaluation and study.

James Keeler, M.D., Kansas City: Dr. Miller mentioned the psychogenic component of pelvic pain and in this he concurs in the theories of a number of gynecologists. Mengert speaks of it as a pelvic neurosis and believes that the resolution of the psychic difficulties which are involved will solve the problem of pelvic pain in most of these individuals. As far back as 1939, Benedeck and Rubenstein made an effort to correlate ovarian activity and psychologic processes in the individual. They believe that from the evidence of their studies there is an increase in heterosexual drive during the high estrogen levels of the menstrual cycle before ovulation and before the menses. If this heterosexual drive and tension are not gratified there is a damming up of the tension with an increased hormone output as a result and a vicious cycle of hyperhormonal activity ensues. Whether one accepts this study or not, it furnishes a possible psychosomatic basis for increase in production of ovarian steriods at times during the menstrual cycle and possibly throughout the cycle.

Greenhill and Freed have attributed the origin of the symptoms of premenstrual tension to the increase in sodium ion retention by different tissues of the body in response to the influence of ovarian steroids. They state that this retention of sodium is associated with an increase in extracellular fluid which may be either microscopic or gross in amount. Under this theory, the neurologic symptoms which often are seen with premenstrual tension are due to edema of the specific tissues which are affected. That some situation exists in this field is evidenced by the recent article of Black of Winnepeg in which she states that by feeding estrogen in small amounts in pregnant women the opposite effect was achieved; that is, they were able to demonstrate, they thought, a release of edema fluid. That, of course, is in contradiction to the work of Thorne and Engle and Friedlander among others. The work of these latter investigators in the study of ion retention effect on ovarian steroids is for the present at least the accepted concept and if this is coupled with the

work of the psychosomatist it evolves a fairly rational concept of the development of gynecologic pains due to edema. In my mind this factor is one of the most important and least understood in the practice of gynecology. All of the other etiologic factors which Dr. Miller mentioned, I believe are directly or indirectly concerned with the production of abnormal amounts of estrogen or the effects of evolved estrogen on the involved tissues.

The effects of vascular and mechanical components are the only possible exceptions to this although here again the effect of estrogen in producing hyperemia and vascular dilatation may be involved. I was particularly interested by one small point that Dr. Miller made on painful pelvic endometriosis. I think that all have seen endometriosis with no symptoms in the patient and others in whom a minimal amount of endometriosis is found and a great deal of pain is complained of. It is possible that this is explained by Dr. Miller's concept on the basis of pelvic edema in the patient. In the treatment of these women, I would like to add my plea to Dr. Miller's for conservatism. Correction of personal hygiene and, where possible, the disturbed home or emotional life of the patient would in most instances effect remarkable results. Use of the postural drainage, via the modified Trendelenberg position, has served well with the more acute aspects of the attack. Above all, I think it should be stressed that these patients are not surgical cases. As Mengert points out, the painstaking uncovering of an emotional situation which the patient is loath to discuss is a time consuming and sometimes a well nigh impossible process. Often one cannot even be sure that the pain is of gynecologic origin. However, one usually can differentiate between anatomically normal and anatomically abnormal pelvic organs and should refuse surgical intervention rather steadfastly in the absence of definite and recognized disease entities.

Kenneth E. Cox, M.D., Kansas City: I think that with respect to psychosomatic difficulties in gynecology, the problem is not that the physician does not know what is wrong with the patient but that the patient does not know what is wrong with herself. The treatment of psychosomatic disease in a large measure is probably orientation of the patient, and I think Dr. Miller brought that out quite well. The patient has a pain and she thinks of every thing until she goes to her physician. It might be cancer, it might be this or it might be that. If one approaches the problem as Dr. Webster suggested not knowing the exact etiology of the pain but assuring the patient that one does and follow a conservative line of treatment, at least one probably will get a large measure of results in alleviating the pain, at least so it is not incapacitating. I would also like to second what Dr. Miller said briefly, the importance of relating psychosomatic components in this disease to allergy. Dr. W. W. Duke, of Kansas City, was one of the first, I believe, to point out the nature of physical allergy, and was a pioneer in allergic circles in discussing allergy to heat and cold and finally allergy to nervous tension. The dermatologists have recognized for years a group of neurodermotoses, so-called, in which the patient breaks out in a rash if they are under enough tension. Many of these patients with pelvic pain certainly have psychosomatic problems, maybe not entirely but in a large part, and I think if one gives this diagnosis first consideration, it is the best guide to the type of conservative treatment as Dr. Miller has outlined.

J. Milton Singleton, M.D., Kansas City: Clinically, I used for a number of years, with the help of Dr. Weber at Kansas University, a dried testicular substance in the treatment of menstrual migrane, breast soreness, menorrhea and menopausal hypertension with what we thought some results. We have used Furstenberg regime for premenstrual tension often with spectacular results. We have been doing some study on premenstrual breast soreness and interstitial thickening and certainly this regime will assist also in palliation of this condition. By examination of breasts one can soon learn to tell whether the patient has soreness in the breasts premenstrually or not and how much and possibly whether this is an acquired soreness following childbirth or other pelvic surgery or injury. One further thing is the reaction to treatment of the cervix. I believe all know that relieving infection of the cervix will reduce not only the size of the cervix but sometimes the size of the uterus itself and, of course, pelvic congestion and pain. Whether this is a reflex autonomic nervous system effect or whether it is purely a result of the relief from infection, I still do not know.

Joseph Webster, M.D., Kansas City: I think that Dr. Miller has psychosomatic first and infections last, when it should be reversed. Infections are still the most common pathologic lesions known and when one says that someone has a psychosomatic disease, that means one does not know what is the matter with the patient. It is a new term for neurosis. So I would consider infections first and psychosomatic disturbances last.

Gerald Miller, M.D., Closing: I wish to thank Dr. Kerr and Dr. Keeler for their contributions in the role of discussants of this paper. I am extremely grateful to those other members of the Society for their extemporaneous discussion. I remain humble in my attitude toward this problem for I feel that much remains to be said concerning its cause and management.

Perhaps I should make some effort to qualify the inclusion of cervical infection as a factor in this picture. Basically, I have not felt that it was a fundamental cause but in many instances the presence of superimposed cervical and proximal infection tend to precipitate or aggravate the clinical picture as presented and, by virtue of this, I have felt that the eradication of such infection was an important therapeutic point. In no way does this become more important than the psychosomatic aspects of this problem.

The question of nutrition has been brought up and here again I feel that this is not a basic factor in the cause of this syndrome, but rather a secondary factor which tends to augment the picture and in many instances surely provokes chronicity. From a therapeutic standpoint, it seems reasonable to believe that in an attempt to expedite a proper adjustment of the patient, proper attention to nutrition is necessary. It truly seems likely that with proper study in nutrition with its resultant effect upon metabolism, and a careful evaluation of the psychosomatic factors involved, that the great majority of these patients would be handled satisfactorily.

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Postgraduate Review

THE MECHANISM OF PULMONARY EDEMA FROM CARDIAC FAILURE

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ACUTE PULMONARY edema is one of the dreaded complications of myocardial disease. Common experience has indicated that seizures of pulmonary edema frequently terminate in death so that even the more mild attacks are considered to be of serious clinical significance. Because of the frequency of the complication, the pathogenesis of pulmonary edema has been studied widely by physiologists and clinicians. Two dominant hypotheses of the pathogenesis of the condition have evolved. First, many workers have stated that edema of the lung results from the overwhelming congestion engendered by severe insufficiency of the left cardiac ventricle. The second theory has held that alveolar edema may result from critical dilatation of the pulmonary vascular bed caused by neural mechanisms and that pulmonary edema does not necessarily result from left ventricular failure. The backgrounds of these theoretical points of view are of some interest and will be reviewed briefly (complete earlier references have been cited by Paine et al.[1]).

Earlier Studies of Experimental Pulmonary Edema.—In 1878 Welch[2] submitted his experimental data which indicated that severe strain of the left ventricle caused by gradual occlusion of the aorta provoked intense congestion and edema. Subsequently, other workers[4, 5, 6] also demonstrated that experimental maneuvers capable of overloading the heart and pulmonary circulation could produce massive edema. Modrakowski[6] showed that isolated lungs could withstand high perfusion pressures without the occurrence of transudation as long as the escape of venous blood from the lungs was unimpaired; however, when these lungs were congested as a result of partial occlusion of venous outflow, only moderate elevations of perfusion pressure were necessary to produce marked alveolar edema. Similar results were obtained in the denervated heart-lung preparation: Barry[7] observed that excessive venous inflow to the heart, together with high peripheral arterial pressure, so overloaded the left ventricle that extreme pulmonary congestion and transudation occurred. Barry likewise demonstrated that, if the viscosity of the blood in the heart-lung preparation was reduced by the addition of Locke's fluid (from 1:053 to 1:045 or 1:050), edema of the lungs would occur.

In contrast, many observers have accepted the hypothesis that pulmonary edema occurs from intense reflex vasodilatation of the pulmonary vascular bed and increased permeability of the capillaries of the lungs. This theoretical premise has been based largely on experiments which produced marked disturbances of the autonomic nervous system.[8] Luisada[8] produced paroxysms of pulmonary edema in rabbits by the use of epinephrine; the paroxysms could often be prevented by the administration of sedatives or by transsection of the spinal cord. He reasoned that pulmonary edema in these experiments resulted from stimulation of the central nervous system centers which control pulmonary vascular reflexes and lung capillary permeability. More recently, Luisada and Sarnoff[9] declared that massive saline infusions inducing "cerebral ischemia" could alter the distribution of blood within the lungs by vasomotor mechanisms and thus permit alveolar edema to form. Jarisch and his coworkers[10] arrived at similar conclusions based on experimental evidence that edema resulted from the intracisternal injection of veratrine in rabbits. The pulmonary edema resulting from experimental cerebral injury observed by Cameron and De[11] was considered to be of neurogenic origin. Moreover, a number of clinicians have cited instances of pulmonary edema which they considered to be of neural origin: intracranial hemorrhage,[12] injuries or hemorrhage into the spinal cord[13] and medulla oblongata.[14]

To this point, the conflicting views of the genesis of edema of the lungs were not reconciled. Although there was ample experimental evidence that left ventricular failure regularly provoked pulmonary engorgement and edema, many clinical studies were cited to show that ventricular function and lung edema were not related. One reviewer[8] stated that lack of evidence for heart failure as a cause of the complication strongly favored abandonment of the explanation. On the other hand, there has been a striking lack of evidence favoring the "neurogenic" concept of edema formation. The important criticism of the fundamental data supporting the "neurogenic" mechanism is that critical evaluation of cardiovascular performance during experimental edema formation was not carried out. Therefore, while epinephrine administered to rabbits causes pulmonary edema,[8] the effects upon cardiopulmonary dynamics were not well investigated. Similarly, the cardiovascular effects of "cerebral ischemia"[9] and of veratrine[10] were not taken sufficiently into account. Recently, McKay[15] subjected mice to hypoglycemia or killed them by crushing injury to the brain. The pulmonary edema found immediately thereafter was assumed to be of neurogenic origin; the possible role of acute

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cardiac failure was not explored. The evidence offered by experiments of this kind has seemed insufficient to warrant support of a neurogenic mechanism of edema formation in the lungs.

Principles of Vascular and Tissue Fluid Balance.—The explanation of pulmonary edema formation is dependent on a knowledge of physiologic fluid balance. There are two main factors which promote fluid exchange between the vascular system and the tissue spaces: (1) hydrostatic pressure within

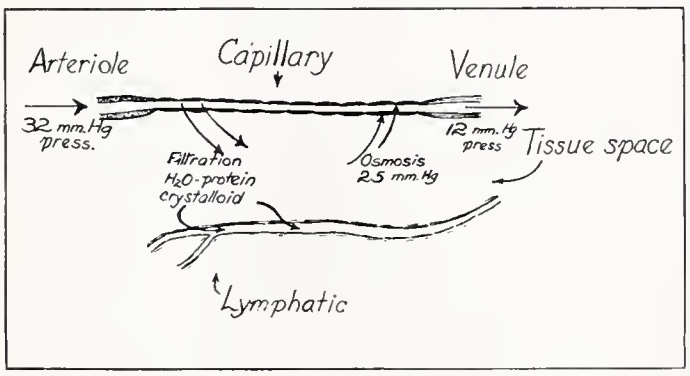


Fig. 1. Schematic representation of fluid interchange between capillary, tissue spaces and the lymphatic system.

the vascular system, and (2) osmotic pressures produced by crystalloid and colloid elements of the blood and tissue fluids.

It has been realized for years that fluid is filtered from the blood stream into the tissue spaces under the influence of intracapillary hydrostatic pressure.[16] Precise measurements by Landis[17] indicated that tension within the capillary is approximately 32 mm. Hg. at the arterial end of the loop, and 12 mm. Hg. at the venous end.

From the standpoint of osmotic pressure, whole blood may be regarded as water containing corpuscles in suspension and inorganic salts and colloids (mainly proteins) in solution. The osmotic pressure of blood *per se* is almost wholly due to the dissolved crystalloids, but to a slight extent to the protein. However, since crystalloid elements are freely interchanged across capillary membranes, tissue fluids have about the same crystalloid concentration as plasma and, therefore, the osmotic difference is almost nil. On the other hand, capillary membranes are not permeable to colloids so that the osmotic pressure of the plasma proteins (though small) is of great functional significance. Because the protein concentration of tissue fluid is even smaller, the plasma protein osmotic pressure serves to attract fluid into the blood vessels. It has been determined that the osmotic pressure exerted by plasma proteins is approximately 25 mm. Hg. when the concentration of the protein fractions is normal.[16,18]

From this evidence, it becomes apparent that fluid filtration from the capillaries under an average pressure of from 20 to 25 mm. Hg. is freely opposed by the osmotic pressure of 25 mm. Hg. and the balance thus achieved assures a reasonably dry tissue under normal circumstances. The experiments of Starling[16] demonstrated these relationships and they have since been known as "Starling's principles of fluid balance."

A further escape for excess tissue fluid is provided by the lymphatic channels. Fluid passing through the lymphatic system contains protein and the walls of these vessels are likewise permeable, not only to large protein molecules, but also to foreign particles and even to large bacteria. It is well known that during such conditions as exertion or venous congestion the formation of lymph is appreciably increased; this augmentation of lymph flow probably reflects a substantial increase in the rate of plasma filtration. The lymphatic system, therefore, becomes important as an additional route by which tissue fluids may be cleared. The importance of this collateral drainage system is further emphasized by the consequences of complete lymphatic obstruction and the resulting severe grades of lymphedema.

Recent Studies of Experimental Pulmonary Edema.—In studies of pulmonary engorgement and edema (consequent to left ventricular failure), it usually has been assumed that the fluid principles described are operative in the lung, although the assumption has not been subjected to experimental test. The question of fluid balance in the lung, therefore, was investigated by Paine and his associates.[1] They were able to demonstrate in heart-lung preparations that when left ventricular overload was imposed by the inordinate elevation of peripheral resistance, there was striking diminution of left ventricular output and dilatation of the chamber. These changes in function were accompanied by elevation of pulmonary venous (left intra-atrial) pressure. With continuing unrestricted venous inflow and right ventricular function, the pulmonary arterial pressure gradually increased and the lungs became turgid and violently edematous. The sequence of events is illustrated in figure 2. In these experiments, it appeared that intense pulmonary capillary filtration, engendered by simple but severe congestion, overwhelmed the mechanisms by which fluid is removed. In addition, they[1] observed that if heart-lung preparations were permitted to function under optimum loads, but the circulating blood was diluted with Locke's solution so that the plasma protein concentration was lowered to approximately 3.0 grams per cent, marked pulmonary transudation occurred. These results implied that the diminution of plasma proteins permitted the excessive accumulation of fluid in the lung tissue because of reduced intravascular osmotic pressure.

Experimental evidence indicates, therefore, that the Starling principles of fluid balance appear to govern fluid balance in the lungs as well as in peripheral tissues. This evidence may be applied further in controlled observations on cardiac function in relation to the genesis of pulmonary edema. In a further study of the role of left ventricular failure in the production of pulmonary dema, Paine

et al.[20] produced sudden myocardial strain by mechanical means, including variants of Welch's technics.[2] These experiments showed again that pulmonary capillary inundation occurred when left heart function was impaired, provided that sufficient venous blood was flowing to the right heart to assure the factor of pulmonary flooding. These experiments also demonstrated that, so far as pulmonary transudation was concerned, the same principles of pulmonary vascular overload operated both in the heart-lung preparation and in the animal with intact circulation. Although mechanical strains of the heart have been the means most readily applicable for producing pulmonary edema, it seemed probable that other ways of invoking decreased left ventricular output might result in similar dynamic effects. Johnson[21] noted that epinephrine administered to rabbits frequently provoked pulmonary edema, apparently because of severe myocardial taxation produced by the drug. Campbell and his coworkers[22] demonstrated that elevation of intracranial pressure in dogs resulted in bradycardia, a fall in cardiac output, with elevation of pulmonary venous and arterial pressures, and pulmonary edema was considered to be present. In these experiments, the heart was normal but cardiac output was evidently depressed through extreme diminutions in heart rate. Paine and Smith[23] repeatedly have observed pulmonary edema (gross and microscopic) in anesthetized dogs which were given epinephrine. They noted that the marked elevation of arterial tension invoked by the drug may be followed by cardiac dilatation and increased pulmonary venous and arterial pressures.

These authors[23] also found that in anesthetized dogs, miliary embolization of the brain with barium sulfate crystals may result in the transient elevation of blood pressure to severe hypertensive levels. In these instances, the heart was usually capable of coping with the increased load and edema of the lungs did not occur. In another group of experiments, the hearts were damaged by aortic valvulotomy prior to embolization of the brain. This procedure invoked free aortic regurgitation with attendant signs of slight cardiac enlargement, waterhammer pulse and marked increase in pulse pressure; however, in most cases this sudden strain was compatible with adequate function of the heart under the conditions of anesthesia and pulmonary vascular dynamics were not altered. Subsequent damage to the central nervous system by barium sulfate embolism brought on ventricular failure with dramatic violence; pulmonary venous and arterial tensions quickly rose and extreme congestion and edema of the lungs occurred. In these instances it is not known whether hypertension precipitated by embolic damage to the central nervous system is due to direct autonomic stimulation or whether discharges of epinephrine may be induced by cerebral damage.[24] It is apparent, however, that although the damaged heart may function adequately under a given load, its reserves may be so curtailed that functional integrity of the myocardium is overcome under further increased loads. It is hardly necessary to point out that these experimental data have clinical counterparts: acute cardiac insufficiency occurring under stress.

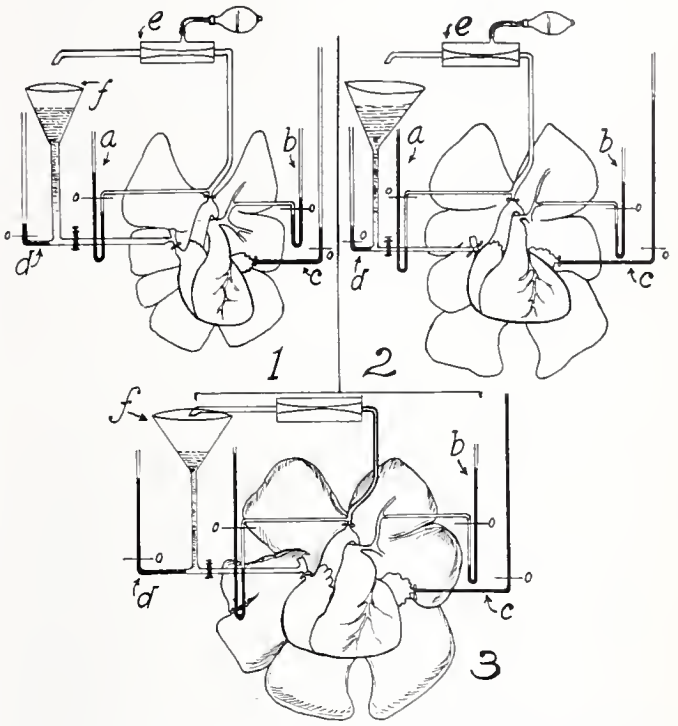


Fig. 2. Diagrammatic sketches of a Starling heart-lung preparation showing pressure changes in the cardiopulmonary circuits, and certain other events in the genesis of pulmonary congestion and edema caused by extreme elevation of peripheral resistance. *a* and *b* represent mercury manometers for recording pressure from the aorta and pulmonary artery respectively. Water manometer c is attached to the left atrium, and water manometer *d* is connected with the venous reservoir *f* to record "systemic" venous pressure. Peripheral resistance is regulated by compression of a thin walled tube through which blood flows, *e*. In illustration No. 1 blood passes from reservoir to the right heart and thence to the lungs under rhythmic inflation by a Starling pump (not shown); pulmonary venous blood passes through the left heart and thence through the artificial resistor *e* and is returned to the reservoir. Such preparations often operate well under arterial pressure of 100 mm. Hg. and cardiac output of 400 to 600 cc. per minute. Pulmonary arterial pressure equals about 20 mm. Hg. mean; left atrial and "systemic" venous pressures are usually at 4 to 6 cms. of water. Illustration No. 2 shows the early effects of marked rise of peripheral resistance (*a*). As left ventricular failure occurs, there is dilatation of the ventricle and left atrium (elevation of left atrial pressure c). The lungs become voluminous as congestion proceeds, and eventually pulmonary arterial pressure becomes elevated (*b*). "Systemic" venous pressure will not rise until right ventricular output is curtailed by inundation of the lungs. In illustration No. 3 continued myocardial strain and marked pulmonary edema and congestion has occurred, with extreme elevation of all pressures. Level of blood in the venous reservoir steadily declines as fluid is lost by severe transudation into the lungs.

The experimental data suggest, therefore, that critical diminution of cardiac output will provoke pulmonary edema when the dynamics are such as to lead to engorgement of the lungs and, thus, in increased pulmonary capillary hydrostatic pressure. Cardiac output may be depressed by direct damage to the heart muscle. It is also probable that certain severe extraneous stresses may lead to marked overload of the cardiovascular system,

especially when functional reserves have been previously impaired.

The Clinical Interpretation of Pulmonary Edema.—In many clinical instances of pulmonary edema, there is outspoken evidence of disease of the left ventricular myocardium. Patients suffering from coronary sclerosis, hypertensive cardiovascular disease, aortic insufficiency and other lesions entailing left ventricular strain, are those in which attacks of pulmonary edema are most liable to occur. On the basis of clinical observation,[25] it appears probable that the dynamic sequences leading to acute pulmonary edema are similar to those observed in experimental animals. Not infrequently the damaged heart may be functionally adequate at rest but, when increased cardiac output is demanded from exertion or other stresses, the output capacity of the left ventricle is deficient in relation to the systemic venous inflow and the propulsion of blood into the lungs by a more competent right ventricle. There is then failure of the left ventricle to accept blood from the pulmonary venous circuit; engorgement and edema of the lungs rapidly ensues. It is also probable that the more sudden and severe the failure of left ventricular function, the greater will be the resultant pulmonary congestion and edema. Furthermore, the tendency to increase blood volume in cardiac disease, and the frequent tendency toward an increase of blood pressure during diminished cardiac output, are factors which may intensify pulmonary dynamic changes from sudden myocardial insufficiency.[26] Another consideration of interest is the repeated observation that patients with mitral stenosis as the sole valvular lesion suffer attacks of acute pulmonary edema less frequently. In isolated mitral stenosis, strain and failure of the right ventricle is usually predominant and overburdening of the pulmonary circulation presumably does not occur.[26] This fact has led to some speculation as to the mechanism of pulmonary edema formation in occasional patients with mitral stenosis. Some observers[27, 28, 29] believed that pulmonary vasomotor stimuli, or other noxious reflexes, arising from distension of the cardiac chambers influenced pulmonary transudation. Other workers[25, 30, 31] have insisted that the occurrence of pulmonary edema in chronic heart disease with mitral stenosis must be related to failure of left ventricular function. The preponderance of clinical and experimental evidence tends to support the latter contention. It is of interest that in instances of well defined mitral stenosis one might expect pulmonary venous and arterial pressures to be elevated and a tendency to pulmonary engorgement to be present. Dexter[32] has demonstrated that the pulmonary arterial pressure and the pulmonary "capillary" pressure are significantly elevated in the presence of mitral stenosis. He further reasoned that increased arteriolar resistance in the pulmonary arterial system tends to shield the capillaries from serious rises of pressure and, therefore, protects against the occurrence of pulmonary edema. Under these conditions, it can be visualized easily that sudden insufficiency of the left ventricle, even of mild degree, might increase pulmonary capillary pressures abruptly with a deluging transudation into the lung tissue.

The occurrence of pulmonary edema in patients following injury of the central nervous system has often excited interest. In some reported instances of cerebral trauma and lung edema, the case descriptions indicate that no evidence of cardiovascular disease was thought to be present prior to the injury. Pulmonary edema occurring under these conditions was therefore considered to be of neurogenic origin.[33, 34, 35] Schlesinger's case[14] was that of a young man who sustained injury to the medulla; when pulmonary edema occurred, abnormalities of cardiovascular system were not suspected. Similar reasoning prevailed in the case of Fontaine and Courtine.[13] They considered that the neurogenic genesis of lung edema was established because of the apparent relief of edema following stellate ganglion block. Other instances of head injury complicated by pulmonary transudation collected by Weisman[12] seemed also to support the view that failure of neurogenic control of the pulmonary circuit had occurred to foster the formation of edema. The clinical interpretation of pulmonary edema may be questioned in such cases when one recalls that failure of function occurred in the normal heart as well as in the damaged heart under various experimental conditions entailing myocardial strain. The evidence has shown that epinephrine may induce cardiac failure in normal dogs, apparently through inordinate elevation of blood pressure. Similarly, in dogs, cerebral damage from particulate embolism of the brain incited marked transient hypertension. The normal heart usually withstood this increment in work load; however, if the heart had been previously damaged, hypertension from military cerebral embolism was followed by severe cardiac insufficiency. In either case, measurement of pulmonary vascular dynamics demonstrated significant edema and congestion, *if* myocardial failure had occurred. Also, the possibility may be raised that in some patients with injury of the central nervous system of critical extent, the occurrence of extraneous factors, such as the elevation of blood pressure, might overload the myocardium to provoke failure and pulmonary edema.

In order to test this hypothesis, Paine et al.[23] investigated the clinical and autopsy records of seventy-nine patients who had died of injury to the central nervous system, or with cerebrovascular accidents characterized by gross intracranial hemorrhage or intracranial neoplasm. Of this total, thirty-eight showed pulmonary edema and congestion at autopsy, of whom sixteen were recorded as having heart disease (all types) and hypertension, nine had heart disease without hypertension; there

were seven instances of hypertension without heart disease and, in six cases autopsy showed no evidence of heart disease but unfortunately blood pressure measurements were not recorded prior to death. The remaining forty-one patients showed no pulmonary edema and congestion postmortem. Fourteen of these patients had neither heart disease not hypertension, eleven had hypertension and heart disease, seven had heart disease alone and nine were recorded as having hypertension but not heart disease. These data suggest, therefore, that in cases of cerebral trauma or other intracranial lesions, there was nearly always hypertension (possible myocardial strain) or frank myocardial disease as the possible cause of pulmonary edema and congestion noted at necropsy. On the other hand, the presence of morphologically demonstrable heart disease or hypertension in patients with intracranial lesions does not necessarily precipitate edema and congestion of the lungs, as illustrated in the second group of cases.

When the information gathered from physiologic experiments and the clinicopathologic correlation is considered together, it appears that engorgement and edema of the lungs hinges upon deterioration of myocardial function. The experimental and clinical observations carried out by Paine et al.[23] do not support a neurogenic concept of edema formation in the lungs, other than the probability that neurogenic mechanisms (e.g., disturbances of the autonomic nervous system) may invoke increased loads upon the cardiovascular system above and beyond physiologic reserves. Previous depletion of cardiovascular reserve may accentuate the severity of failure when such neurogenic mechanisms are brought into play.

By way of emphasis, it may be stated that sudden fright or anxiety or prolonged periods of mental tension often will be characterized by signs of increased cardiovascular load so that the resulting elevation of blood pressure, tachycardia, weakness and generally increased metabolism may have serious repercussions on myocardial function. Such patients who have coronary insufficiency, heart muscle hypertrophy or serious valvular disease may be precipitated into acute left ventricular failure and pulmonary engorgement and edema. Therefore, from the physiological standpoint, the therapeutic weapons of morphine (to allay the fear and anxiety that begets increased circulatory load), phlebotomy (to attempt to relieve unrelenting pressure against the right ventricle and the engorged lungs), the use of digitalis to improve myocardial function, the restriction of sodium chloride intake and oxygen treatment remain the best tools for use when the integrity of the myocardium is severely compromised. By the same token, the restriction of activity of the cardiac patient and encouragement of general tranquility are measures of prevention worth many more times the cure against the accident of acute heart failure.

SUMMARY

A general survey of the experimental mechanisms concerning the formation of edema in the lungs has been presented and an attempt has been made to develop the concept best supported by the evidence.

1. The hypotheses that (a) pulmonary edema may result from acute failure of the left ventricular myocardium with resultant pulmonary engorgement, or (b) that it may occur from direct neural reflex effects upon the pulmonary vasculature were set in contrast.

2. Examination of the principles of fluid balance in peripheral tissues (the Starling principles) indicates that filtration of fluid occurs from the capillaries into tissue spaces and that recall of the tissue fluid into the blood stream is largely dependent upon osmotic pressure exerted by the plasma proteins and, also, to some degree by the contained electrolytes. Experimental evidence has been reviewed which demonstrates that the same principles of fluid balance operate in the lung. The indication seems clear that critical diminution of osmotic forces (lowered plasma protein), or congestion of pulmonary capillaries (as occurs in heart failure) will provoke transudation of fluid into alveolar spaces.

3. Further investigation has indicated that failure of the left ventricular myocardium, produced by various means, induces severe pulmonary congestion with copious transudation of fluid into the lungs in conformity with the principles of fluid balance previously described. We could uncover *no* evidence that reflex (neurogenic) effects upon the lungs are directly concerned with edema formation.

4. Myocardial overload and failure may also be produced by apparent extraneous factors such as sudden severe hypertension engendered by abberant stimulation of the autonomic nervous system. In the experimental animal the administration of epinephrine may produce violent elevation of blood pressure to overwhelm the otherwise normal heart. Further investigation has revealed that certain cerebral damage in dogs may provoke hypertension; when the hearts of these animals were previously damaged, similar cerebral damage frequently precipitated heart failure and pulmonary edema. A clinicopathologic correlation of patients coming to death with certain types of intracranial disease, and whose hearts were damaged by chronic disease, indicated the possibility of heart failure as the cause of pulmonary edema and congestion which was found at autopsy. We could find no valid clinical evidence that disease of the central nervous system *per se* caused pulmonary edema.

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Head Pain as a Diagnostic Lead

Frequently the presence of head pain is overlooked. The physician learns of it only if he has made an effort to elicit the information. Since the etiology of the pain is the basis of rational management, the patient should be warned against taking medication before diagnosis is made.

Friedman[1] deplores the tendency to call any chronic recurring headache migraine. Careful history-taking and full physical and neurological examinations are essential for accurate diagnosis. A good starting point is a description of the headache — its character, laterality, frequency and intensity.[2]

The following chart gives briefly the primary diagnostic leads and treatment for the most common types of headache.

Etiology of Headache	Primary Diagnostic Data	Primary Therapy
Inflammatory e.g., Meningitis Abscess	Inflammation of intracranial structures; fever; leucocytosis; bacteriologic diag.	Specific: sulfonamides and antibiotics. Symptomatic: analgesics.
Tumor	Pain varies as spinal press. changes; skull X-ray.	Specific: surgery. Symptomatic, analgesics &/or hypnotics.
Sinusitis	Sinus congestion and infection; cloudy X-ray.	Specific: antibiotics and drainage. Symptomatic: analgesics.
Hypertensive	Hypertension present but pain not related to b.p. level; Dihydroergotamine. relieves pain.	General hypertension therapy; sedation. Symptomatic: analgesics.
Migraine & other vascular headaches	Headache: recurrent, intense, throbbing. No organic causation; migraine in family; patient: energetic, perfectionist. Visual prodromata; g-i. upset during headache.	To abort attack: oral ergotamine plus caffeine. General: adjustment to minimize nervous stress.

Data here tabulated is from: Wolf, G., Jr.,[3] and Friedman, A. P.[4]

Cecil[5] ranks vascular headaches, e.g., migraine and tension headaches, as the most commonly encountered of all. Because of their functional nature and usual recurrence at frequent intervals, they present a long-term therapeutic problem.

Therapy is conducted along two lines:

1) Psychotherapy to reduce the frequency of attacks. This consists mainly of advice on emotional adjustment to stressful situations and guidance toward a good balance between work and relaxation.

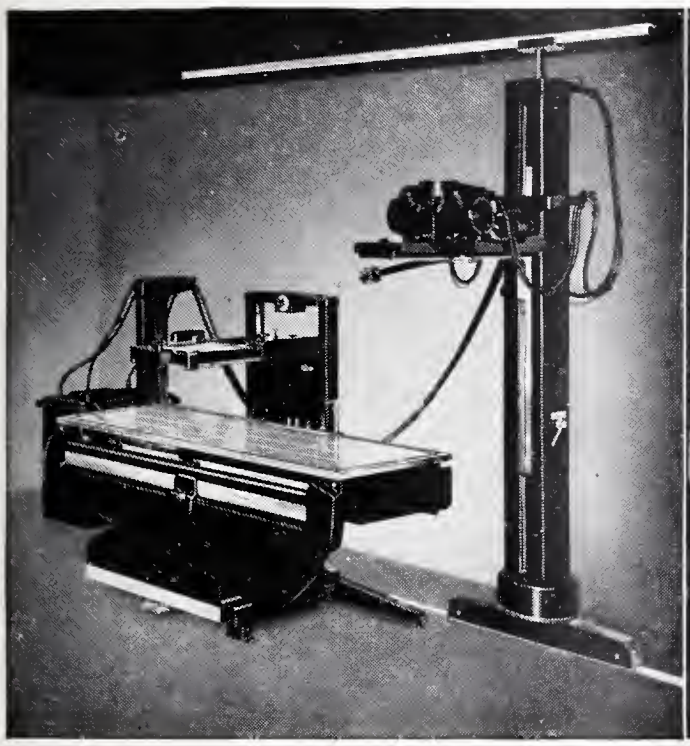
2) Treatment of the distressing attack to prevent the usual period of incapacitation. Many investigators have reported that ergotamine preparations are effective for relief of the acute migraine attack in 80% of cases.[1,6] *The drug is given immediately when an attack is approaching and dosage adjusted to the needs of the individual.*

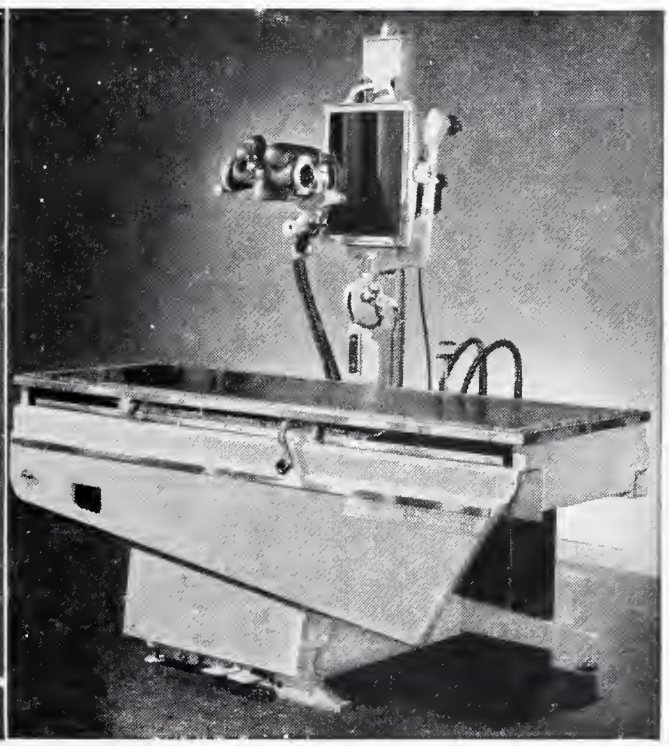
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Clinical Conference

CANCER OF BOTH BREASTS, 53 CASE REPORTS

E. L. KEYES, M.D.
ST. LOUIS
E. J. JORDAN, M.D.
ST. LOUIS
AND
J. P. WYATT, M.D.
ST. LOUIS

E. L. KEYES, M.D.: This conference deals with cancer of both breasts based on fifty-three examples of the bilateral condition among 428 patients who had the condition, either unilaterally or bilaterally. The incidence in this series, 12.4 per cent, exceeds that of other series, the next highest incidence being 10 per cent (table 1) by Haagensen.[1]

This is a double series, the first comprising fifteen of the fifty-three patients with bilateral mammary cancer from 116 patients of a low income group at Firmin Desloge Hospital collected by Dr. Jordan; the second comprising thirty-eight of the fifty-three patients with bilateral mammary cancer from 312 private patients of the late Dr. Ellis Fischel and of my own. The incidence in the two series closely approximates each other, being 12.9 and 12.2 per cent respectively.

Table 1. *Incidence, Bilateral Breast Cancer*

Per Cent	Bilateral to Total	Author
12.9	15/116	Jordan
12.2	38/312	Fischel, Keyes
10.0		Haagensen[1]
5.0	18/363	Cullen, Burns[2]
5.0	5/98	McWilliams[3]
4.4	289/6,559	Harrington[4]
4.0		Lewis, Reinhoff[5]
3.2	9/278	Willy Meyer[6]
2.0	6/298	Finney et al.[7]

E. J. JORDAN, M.D.: The high incidence in the two series indicates the fruit of intensive follow-up of patients with breast cancer. The more careful the follow-up, the more patients with unilateral mammary cancer eventually will be found to have the condition bilaterally.

One male was found in Dr. Keyes' and my series with cancer bilaterally, the incidence curiously being identical in both series, one male out of 312 total breast cancer patients both unilateral and bilateral, both male and female. The figure 116 in table 1 for my total patients requires comment, and represents followed breast cancer patients only. To it must be added 205 other unfollowed breast cancer patients to bring the total in my series to 312, the identical figure with the total patients in Dr. Keyes' series.

Two of my fifteen patients with bilateral breast cancer were pregnant. The one, aged 38, was eight months pregnant when first seen. She had a lump in the right breast of twenty-one months' duration. She was delivered of a viable baby following radical mastectomy. Cancerous pleural fluid appeared three months later and at necropsy, seven months after operation, the opposite (left) breast was found cancerous, together with skin and visceral metastases. The other patient, aged 39, when seven months pregnant reported with advanced ulcerative carcinoma in the right breast of ten months' duration. Following radical mastectomy her child was stillborn. At necropsy three months postoperative the mother was found with cancer also in the opposite (left) breast, with visceral metastases.

Now to illustrate some of the noteworthy features in the assessment of future patients, four other examples of bilateral mammary carcinoma will be set forth in more detail.

BILATERAL BREAST CANCER NINETEEN YEAR SURVIVOR

Case 1 (W. E. Leighton, M.D., D. C. Weir, M.D.). In 1931 Mrs. E. S., aged 48, had a tumor 3 cm. in diameter in the upper outer quadrant of the left breast. Left radical mastectomy was done, the diagnosis being verified histologically as adenocarcinoma invading lymph nodes in this axilla.

In 1943 she developed a tumor 5 cm. in diameter, also in the upper outer quadrant, of the right breast. She underwent right radical mastectomy with the diagnosis again being adenocarcinoma, histologically, with invasion of the axillary nodes.

In 1949 skin nodules appeared on the right field of operation but regressed completely following x-radiation with 4,500 r units. In 1950 she remains clinically well, nineteen years after the first and seven years after the second radical mastectomy.

DR. KEYES: Twelve years elapsed between the appearance of cancer in the two breasts of this patient. Seventeen years was the longest interval between cancer in the two breasts among our private patients and an interval of sixteen years has been observed in two other patients (Cullen,[2] Finney[7]). The average elapsed time in forty of our patients with "nonsimultaneous" bilateral breast cancer, as Harrington[4] calls this type, was from two months to five years, as can be seen from table 2.

Table 2. *Interval Between Involvement of the Two Breasts*

Simultaneous	2 patients
2 months to 1 year	9 patients
2 to 5 years	10 patients
6 to 17 years	4 patients
Interval known	25 patients
Interval unknown	17 patients

SIMULTANEOUS BILATERAL BREAST CANCER, FIVE YEAR SURVIVOR

Case 2. (E. J. Jordan, M.D., D. C. Weir, M.D.). In 1938 Mrs. F. M., aged 47, had tumors in the upper outer quadrants of each breast, both hard and, on clinical examination, carcinomatous. The one on the left measured 6 cm. in diameter, and that on the right 1 cm. in diameter.

Tumor Teaching Conference No. 92, July 20, 1950.
From St. Louis University School of Medicine, Departments of Surgery and Pathology and Cancer Control Committee.
Aided in part by Grant CT 619 USPHS, and by the Missouri Division, American Cancer Society, Inc.

The left breast was biopsied first and proven cancerous on frozen section. Radical mastectomy followed immediately. Metastases were found in the axillary nodes on microscopic examination.

An unavoidable delay of six months occurred in investigating the right breast. The right breast then was biopsied and reported as adenocarcinoma on frozen section. A right radical mastectomy was done. Dissemination of this malignancy into the axillary lymph nodes had already occurred. X-radiation was administered postoperatively.

The patient died of carcinoma in the sixth postoperative year.

Dr. Keyes: Patient 2 represents the simultaneous type of bilateral breast carcinoma if one assumes, as seems probable, that the right breast contained carcinoma at the time the left breast was operated upon, six months previously. The five year survival of this patient is notable, for Harrington has shown the prognosis of the simultaneous type of bilateral breast cancer to be poorer than the prognosis of the nonsimultaneous type (table 3). The practical point, rather than to remember exact figures, is to follow a patient indefinitely after the radical removal of one of her breasts for cancer, remembering that cancer may appear in the remaining breast as long as twelve years later and still be amenable to control for five years or longer by the radical removal of the remaining breast, as in patient 1.

Table 3. *Five Year Survival Rates, Bilateral Breast Cancer (Harrington).*

Nonsimultaneous Type
43.8 per cent of 74 patients with axilla involved
85.1 per cent of 73 patients without axilla involved
Simultaneous Type
17.9 per cent of 39 patients with axilla involved
61.5 per cent of 13 patients without axilla involved

CANCER IN BILATERAL SUPERNUMERARY BREASTS, EIGHT YEAR SURVIVOR

Case 3. (E. Fischel, M.D., E. L. Keyes, M.D.). In 1938, Miss M. M., aged 40, noted a hard mass 1 cm. in diameter in the left axilla just beyond the tail of the left breast. On biopsy this proved to be adenocarcinoma arising in accessory breast tissue. Radical left mastectomy was performed and no carcinoma was found either in the left breast or in the left axilla.

Two years later the patient noted a similar hard mass 1 cm. in diameter in the right axilla just beyond the tail of the right breast. On biopsy this proved adenocarcinoma, again in accessory breast tissue separate from the main breast. Radical right mastectomy was performed, and again no carcinoma was demonstrated histologically either in the main right breast or in the right axilla.

Her family history was interesting. Her sister died at the age of 34 of breast cancer, as did her paternal grandmother. However, her twin sister still survives without evidence of breast disease.

The patient remained in good health for eight years, dying the ninth year of metastases, apparently from a third primary tumor in the uterus, as proven by laparotomy.

Dr. Keyes: Prognosis in bilateral breast cancer is influenced by still another factor; namely, whether the cancer in the second breast is a second primary cancer or whether it is a metastasis from the original cancer. With a second primary cancer, as in patient 3—incidentally an interesting example of bilateral origin in heterotopic breast tissue—the prognosis is relatively favorable, as table 4 indicates.

Table 4. *Five Year Survival Rate. Bilateral Breast Cancer (Jordan, 1933-1945)*

13 patients treated
5 survivors following first radical (38 per cent)
3 survivors following second radical (23 per cent)

Table 4A. *Five Year Survival Rate,* Bilateral Breast Cancer (Fischel, Keyes)*

Second Primary Type, 5 of 12 patients, 42 per cent
Metastatic Type, 0 of 9 patients, 0 per cent

Dr. Keyes: Evidence to support the belief that a second tumor arising in a breast is of autochthonous nature has been supplied by Warren and Cates.[8] The criteria advanced by these authors have all been fulfilled in patients 1 and 3.

"Each of the tumors must present a definite picture of malignancy.

"Each must be distinct.

"The probability of one being metastasis of the other must be excluded.

"Some writers feel that if several or more years have elapsed since the original mastectomy and there are no other signs of local recurrence or metastatic disease elsewhere, the second can be considered to be primary if it is microscopically different from the original one."

To these criteria, one might add that if the second tumor arises in the outer hemisphere, it is more likely a second primary tumor than if it arises in the inner hemisphere of the remaining breast where metastases are apt to arise by contiguity.

MALE WITH BILATERAL BREAST CANCER

Case 4. (W. E. Leighton, M.D.). In 1940 Mr. L. M., aged 49, noted hard fixed nodules in both breasts with hard nodes in the right axilla. The skin of his chest showed radiation dermatitis from x-radiation thirty-three years previously for eczema. The left nipple had been the site of a tumor of unknown histology, removed twenty-two years previously.

The patient's grandmother, at the age of 107, underwent radical mastectomy for carcinoma. Dr. Leighton had also removed a breast cancer in the patient's mother.

Both the patient's breasts were removed by simultaneous bilateral mastectomy plus bilateral axillary dissection. Histologically, the tumors were adenocarcinoma, with metastases to the right but not the left axilla. The patient died in 1944.

John P. Wyatt, M.D.: The bilateral breast tumors of this man, patient 4, were adenocarcinoma, and not squamous carcinoma secondary to irradiation.

The outstanding feature noted in this histopathologic examination of patients 1 and 4 was the basic native picture of adenocarcinoma. From a review of the literature, as well as from the patients under study here, the common histologic pattern encountered was a well differentiated malignant epithelial tumor of the breast.

In the examples from the literature of simultaneous bilateral breast cancer, histologic analysis

revealed a background of chronic cystic mastitis Certainly in bilateral carcinoma there is some evidence to indicate that the malignancy is superimposed upon the "innocent" hormonal disease of chronic cystic mastitis.

Knowing the high incidence of carcinoma in the breast, it is interesting to speculate on the reason or reasons why carcinoma is not more frequent in such a paired organ as the mammae. The bulk of evidence would suggest that no one factor is responsible for mammary cancer but that genetics, hormones, possibly even filtrable agents may, singly or together, exert a carcinogenic effect upon the breast, or breasts.

Detailed causative analysis of our four case reports reveals only in patient 4 any evidence, clinical in nature, to indicate an extrinsic as well as an intrinsic factor operating within the individual by predisposing to development of malignancy. This patient gave a history of ionizing radiation thirty-three years previously, sufficient in amount to have provoked permanent alterations. A strong family history of breast cancer was also present in this case history. Therefore, both agents, the genetic background of "familial cancer" and the therapeutic radiation, may have acted in a conjoint manner or a supplementary fashion. Such a combination is unusual, particularly in the male in which sex bilateral mammary carcinoma is exceedingly rare.

Extrinsic factors influencing the development of cancer in the male breast are supported by the findings I recall in a patient autopsied several years ago with bilateral breast cancer after having received intensive estrogen treatment for cancer of the prostate.

DR. KEYES: To continue the discussion as to causation of bilateral mammary cancer in the male, Howard and Grosjean[9] observed a male who died of bilateral scirrhous mammary carcinoma which had arisen simultaneously in the two sides during the five years following the administration of 40,000 milligrams of diethylatilbesterol. Liebgegott[10] recorded the case of another male, aged 66, with histologically proven carcinoma of the left breast plus a mass the size of the fist in the right breast, not biopsied; over 14 months time the patient had received two intramuscular implants of an estrogen for carcinoma of the prostate. Certainly in these two men, hormonal influences seemed to play a prominent part in causing their bilateral mammary carcinoma.

A final word as to age and family history may be added to conclude the discussion of bilateral mammary cancer. Our patients averaged 47 years at time of the development of the first of their bilateral mammary carcinomata; whereas our patients with unilateral mammary carcinoma averaged 51 years of age.

A high incidence of mammary cancer was found in blood relatives of our private patients with mammary cancer, twenty-one of our 154 patients, or 13.6 per cent, having such a history.[11] No difference statistically could be found in this figure between patients with bilateral as compared with patients with unilateral mammary cancer; however, the incidence was significantly higher than the 2.8 per cent incidence in a control series of private patients with cancer of the lip, reported elsewhere.[12] Willis[13] has recorded this interesting family history: "in a family reported by Wood and Darling, cases of bilateral mammary cancer occurred in four generations, including three sisters in one generation; the growths appeared at an average age of 32, i.e., earlier than usual, and one patient in the fourth generation developed the disease at the age of 18."

R. H. WEAVER, M.D.: I should like to bring up a few facts which may connect radiation injury with the bilateral simultaneous mammary carcinoma developing in patient 4 at the age of 49, who was said to have received roentgen therapy some thirty-three years previously, probably unfiltered rays, administered for eczema. In experimental carcinogenesis it is found that about 15 per cent of an animal's life span is required for the development of malignant growth in response to a calculated carcinogen. The Navy group working on the atomic bomb tests, headed by Shields Warren, was convinced that even an erythema dose of x-ray is carcinogenic.

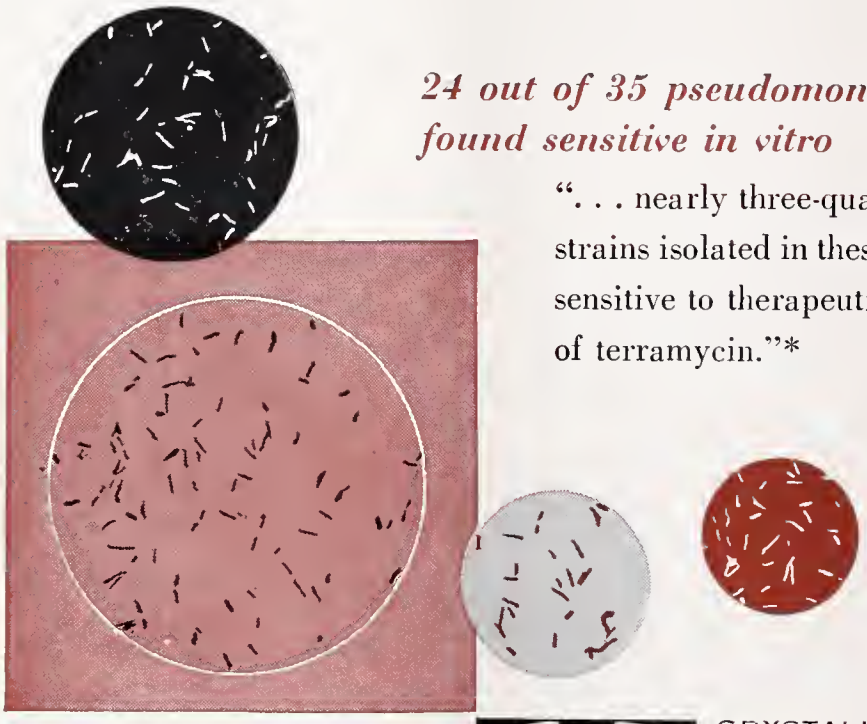
SUMMARY

DR. KEYES: In summary, it appears that carcinoma will be found in the remaining breast following radical mastectomy in 12 per cent of women in carefully followed series. It is conceivable that the cancer in the second breast may be of the second primary type in which case almost half the patients may be expected to survive five or more years following adequate bilateral radical mastectomy. If the tumor in the second breast is metastatic, however, the prognosis appears unfavorable. Should the incidence of carcinoma in the remaining breast continue its apparent rise, one should entertain the idea of prophylactically removing the second breast shortly after the initial radical mastectomy.

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Case Report

APHASIA RESULTING FROM CORK BALL INJURY OF HEAD

FRANK A. PALAZZO, M.D.
ST. LOUIS

THE CASE HISTORY presented illustrates the importance, at times, of relatively minor trauma in the production of serious cerebral injury, as well as the value of early surgical intervention.

In St. Louis and vicinity the game of cork ball, a variant of baseball with no base runners has become popular. The game is rapidly spreading in popularity throughout the country. A small, light but firm, horse-hide covered ball is used, made of solid cork with gum yarn wound to 1⅞ inches in diameter. Serious eye injuries have occurred not infrequently in players struck in the eye by this ball. A direct hit with a ball of this size will penetrate deeper in the orbital fossa than would a ball of larger size. However, one would hardly suspect that a blow by such a light ball could cause damage to the brain, encased as it is in the bony framework of the skull.

CASE REPORT

R. Y. (Case No. 50-8949), a 30 year old truck driver, was standing at bat waiting to swing and was struck over the left ear by the cork ball. The patient was not knocked down, but was momentarily dazed. He did not lose consciousness. Following the blow the patient had a strange look and his speech gradually became garbled and incoherent. Three hours after the injury he spoke no words at all.

Four hours after the blow he was seen by his first medical examiner who felt that the patient was well in all respects neurologically except for what seemed to be a slightly dazed attitude and lack of spontaneous speech.

When I saw the patient he was sitting or walking about, completely at ease, smoking and enjoying an occasional cigarette, apparently not too much concerned about his condition. He smiled when greeted and appeared oriented to his surroundings and the relatives accompanying him. On questioning, he nodded assent or dissent, or had a somewhat bewildered look when he did not seem to comprehend.

Neurologic examination was objectively normal but the patient's obvious orientation and gesturing to convey his thoughts made it apparent that he had a motor aphasia. He was able to select the correct answer to a spoken question from several possible answers written on a sheet of paper for about half of the questions which concerned details of his injury, name of hospital, relatives and wife, dates and such, indicating a partial word blindness. His bewildered expression when unable to nod assent or dissent to a spoken question couched so as to require a simple "yes" or "no" answer, revealed a partial word deafness. He cooperated well for cranial nerve examination but he showed some perseveration and repetition, closing his eyes when asked to open mouth or to protrude tongue.

When asked about headache the patient pointed to the left temporal region, just above the left ear, where there was little detectible superficial swelling and only moderate tenderness.

Roentgenograms of the skull revealed a depressed comminuted fracture of the thin squamous portion of the temporal bone. The defect was oval in outline, measuring 3 by 2 inches in diameter and crossing the middle meningeal vessel markings. The fracture was depressed one fourth of an inch at the most.

A craniotomy was performed eight hours after injury removing the depressed comminuted fragments of the left temporal bone underlying the temporal muscle which hid the defect on clinical examination. Beneath the comminuted bone was a layer of firm blood clot extradurally, about one fourth inch in thickness. The clot was evacuated. The dura was intact but a discoloration subdurally was seen through the translucent dura. On opening the dura there was no subdural bleeding or clot, but the entire cortex surrounding the upper two thirds of the Sylvian fissure showed a diffuse, dark purplish discoloration. There was no focal cortical swelling or rupture of the pia-arachnoid membranes and the brain pulsated freely following its exposure. The wound was closed in the usual fashion, with the temporal muscle covering the bony defect.

The next morning, ten hours following operation, the patient was awake and quite alert but still unable to formulate words. He still indicated his needs by means of gestures. Forty hours after operation he could speak a few simple words, usually single, such as "yes," "please," and "no sir." His facial expression and gestures evidenced his awareness of his failure in verbal expression and selection, since his monosyllabic replies were not always pertinent to the questions asked.

His speech gradually improved so that by the fifth day he spoke phrases, not always complete or entirely correct, but usually adequate for transmitting the idea intended. Speech was still slow and articulation was performed with a conscious effort.

When the patient left the hospital eleven days after operation, he was able to play "hearts" with his wife, but did not win as often as he usually did. Speech was still performed slowly with a conscious effort, but he uttered short sentences which he used correctly. Occasional words in the sentences were garbled and slurred but were recognized to be similar to the word he apparently had in mind. He could write most spoken words correctly, although the spelling of his written words was often glaringly incorrect. Reading was still slightly impaired.

One month after operation he had no reading difficulty; speech was correct and apparently quite normal in all respects except for a persistent difficulty in enunciating clearly and without hesitation. Arithmetic was handled easily and the patient was back at work driving his truck and handling all financial transactions along the route without any errors. Two months

From Section of Neurosurgery, St. Louis University School of Medicine, St. Louis, Missouri.

after operation speech was free and accurate with no observable aphasic disturbance, motor or sensory.

Nielsen[1] cautioned against diagnosing aphasia in cerebral concussion since the patient may not be mentally clear, may fail to express himself well, cannot write, read or comprehend. This is especially true in the severe head injuries. However, the reverse is not infrequently the case, wherein a patient with a head injury may have an aphasia which will go unrecognized, the speech difficulty being attributed to "shock," mental torpor or even hysterical aphonia.

Recovery from aphasia following severe head injury is not uncommon even in the early literature.[2,3,4] Hammond[4] reported a patient with complete recovery from aphasia following head injury. The injury was severe, knocking the patient unconscious and producing a partial motor aphasia of several months' duration. Recovery of speech was apparently complete, even though the fractured inner table of the skull was elevated three months after injury. Aphasia of relatively long duration is apparently not always permanent.

On the other hand, Nielsen[1] patient (Case 2) had a complete motor aphasia following severe closed head injury without skull fracture, but had no recovery from the aphasia even one year after operation. At operation only a contused blue-black area of brain was found in the vicinity of the Sylvian fissure, similar to the findings in the present case report.

The squamous portion of the skull is the thinnest portion of the skull and, therefore, the most vulnerable to fracture by a localized blow, even of moderate proportions.

SUMMARY

A patient had a complete motor aphasia following a relatively minor injury. Recovery following early surgical intervention was complete within two months. This case serves to point out the possibility of serious head injury from the game of "cork ball" now locally popular and rapidly spreading in popularity across the country. A word of warning to participants of the sport as to the dangers of blows on the sides of the skull, immediately above the ears, would be timely.

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Ran into him, though, over at Harpersbury, yesterday. Still hale and hearty—doesn't look half his age. He makes extra money guiding campers and hunting parties. Told me about something that happened to him on his last trip.

"We lost our way, back of Ten Mile River," he says. "And when I reached for my compass to check up, I found I'd brought the wife's compact by mistake! I used the sun to find the river, and we finally got out—but I sure felt like a real greenhorn . . ."

From where I sit, this shows how even the experts can get mixed-up at times. Take the way some "experts" would deny us the right to a glass of beer—or the way still others would like to tell a man how to practice his profession. I say they're experts only at minding somebody else's business!

Joe Marsh

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Special Article

PERSONAL MEDICAL DISASTER INSURANCE

A. M. WILSON
BOSTON, MASS.

PLEASE ACCEPT my sincere thanks for the opportunity of speaking to you on the most challenging subject faced by the accident and health industry —insurance coverage for medical costs of a major illness.

The personal, financial problems resulting from serious illness and their economic consequences on the individual and on the community are of a dual character. The first is loss of income by reason of long term disability. The second is the financial crisis resulting from the cost of medical care. My subject for today is confined to the second phase of the problem.

The economic biography of the average man and woman under our way of life, in spite of the poetry of the Horatio Alger and the dramatic sentimentality of the socializing collectivist or spurious communist, is still a simple and understandable document. The male and female have at least one thing in common. They start out in life with the same propensity for feeding, squawking, soiling and upsetting the best intentioned home routines until such time as their clothes can safely be included in the family laundry without loss of family pride. Then comes grade school in which the household budget is constantly under attack for shoes, pants, toys, books, supplies, music and dancing lessons, and medical bills for measles, mumps, chicken pox and broken bones. But take the economic view of the kids. With and without weekly allowances, they are at all times either badly bent or broke. They have basic security, but little cash. Some of our politicians would like to put the whole nation on the same basis. When that happens, there will be no further need ever to grow up.

Then comes high school with greater strains on the household budget. But Junior's economic lot improves slightly. Gradually his faith in personal financial success is transferred from mother's household budgeting miracles with copper and silver to father's broad view of the international insignificance of a dollar bill. Then, too, Junior's earning power in his own right moves into the copper and silver era of his domestic life through odd jobs hustled and connived in true American tradition. Unfortunately for Junior, his female counterpart at this stage of the game begins her career of dependency. The copper and silver find their way into the corner drugstore and movie house to finance the most contradictory economic proposition known to man—love. During the period of higher education, it is Junior who speaks of the international insignificance of the dollar, while father more often than not rediscovers copper and silver which he now uses for lunch.

So Junior finishes college filled with illusions of his own economic worth to industry and, after a short period of time, settles at or near the bottom, confident and willing to climb to the top. This is followed by marriage and a rediscovery of the economic significance of time. There is time to pay anything—time payments on a house, time payments on furniture, time payments on a refrigerator, television, diamonds, washing machines and babies. And with the babies, the economic cycle begins all over again until retirement age, when either success will have provided some degree of security or government takes over under Social Security.

The economic cycle of life has three major obstacles: (1) loss of job opportunity, (2) serious illness, (3) death. Loss of job opportunity is a social problem not within the scope of this discussion. Death is a problem that has been well met by life insurance. Serious illness and the economic cycle are our problem. More specifically, what can insurance do to guarantee that when a man reaches retirement age he will not find himself impoverished by loss of his savings and real wealth through costs arising from serious illness?

In the use of the word "serious," it should be understood that it has nothing whatsoever to do with the nature of the illness. Serious, as used here, is related entirely to the financial loss resulting from a condition which some physician is ready to treat. Thus, the hypochondriac who squanders his wealth in pursuit of illusory health is suffering from serious illness as much as the man with a brain tumor, the removal of which costs a fortune. Again, short term illness, by reason of its cost, is frequently as serious financially as long term illness and is much more frequent. Hence, duration of illness is not the determining factor of serious illness. Again, disability, meaning the inability to perform the duties of one's occupation, is no criterion of serious illness. The man with the injured back may spend a fortune for medical care just in order to be able to stay on the job. Finally, serious illness need not involve personal illness. The man who has had to spend a fortune for medical care on his wife, or an unfortunate child, is suffering as much from serious illness as the one who is personally ill. The final financial consequence on his life, that of his family, and his community is the same.

What has been done to date in the field of insurance is good. Hospital Insurance, both through insurance companies or Blue Cross; surgical insurance; and, more recently, medical insurance to cover home and office medical fees has made a major contribution to the economic security of the industrial worker. All of these plans, however, are

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Address to Federation of Employees' Benefit Associations.

geared to meet the normal medical costs of illness which are of common and frequent occurrence. They do not take care of the unusual situation that can and does occur, and for the person who has an income over $4,500 or $5,000, or more, the amounts provided are often inadequate. Yet, strangely enough, demands for increased coverage, as exemplified in collective bargaining agreements completed during the last few years, show an increasing tendency to provide coverage for the $3 and $5 items of medical expense without reference to the major items which can destroy a man's wealth.

Paying small items of medical expense merely adds to the overall expense of medical insurance. Few people stop to consider the costs involved in paying a $3 benefit check. By the time the benefit is approved, the check drawn, the record created, the bookkeeping entries made, and the financial report drawn, all of which are required by law, the cost of paying the check is higher than the benefit itself. All agree that such a plan does not follow the principles established by elementary financial arithmetic. We do, however, go along with such plans because we are in business to render an insurance service to our policyholders and, if their insurance needs are thus specified, we have no choice but to meet them.

It is recognized, of course, that a series of small medical bills can run into a substantial sum. All have witnessed cases in which one member of the family after the other incurred medical expenses within a short period of time, placing a tremendous burden upon the wage earner. Since the future of our country is based upon family life, it may be that the problem of medical care should have been attacked at a family level. I personally hope that the time will come in the not too distant future when we, an insurance industry, can approach the head of a family and for a reasonable price offer to pay all medical expense of that family in excess of an annual medical cost paid by the family of $100 or some other specified amount. To make such an offer now, without knowing the answers to the underlying basic economic problems, would be tantamount to committing economic suicide, a thing which only the socializers can do gracefully, since they have already abandoned faith in our way of life.

The basic problems are:

1. Instability of the purchasing power of the dollar.

2. Constant increases in the cost of medical care due to technological advancement in the practice of medical care.

3. Undetermined fee schedules of specialists and variations of fees based upon individual physician's estimate of patient's ability to pay.

4. False propaganda that medical care can be provided for all on an insurance basis at a cost of a few pennies a day.

I do not presume to know the answer to stabilizing the purchasing power of the dollar. All I know is that with the constantly decreasing value of the dollar, any insurance plan that provides payments of benefits in excess of the anticipated actuarial average, which actuarial calculation is based upon the present value of the dollar, will tend to produce higher loss costs and, therefore, higher premium costs year after year in proportion to the decrease in the value of the dollar. This has been the fundamental problem of all those insurance plans such as Blue Cross and Medical Service Plans which agree to provide services rather than dollars. Their income is set at a dollar level. The cost to them of service fluctuates with the value of the dollar. For that reason, the last five years have found them repeatedly having to increase their premiums, plus, in many instances, changing their liability to a dollar limit for the board and room portion of coverage. No matter how expeditiously this matter of increased premiums or reduced coverage is handled, it always produces a disturbance in the faith of the people who buy the insurance. This disturbed faith is fertile ground for the socializers who condemn the insurance industry for failure, while they hide the truth that the trouble arises from the muddle produced by befuddled, economic planning quackery. Thus, it becomes axiomatic that any plan of benefits that provides coverage sufficiently high to take care of the high cost cases will have to be based on a price structure that can be changed with the purchasing power of the dollar. In order for any insurance plan to be successful, the seller and the buyer must understand this fact. The second axiom is that liability for future medical expense arising from a cause that begins in the present must be closely related to the present purchasing power of the dollar.

The next problem arises from technological advances in medical science. A physician's office used to be a rather simple establishment, consisting of a varied number of shelves with multicolored pills, a few sturdy chairs, a table loaded with magazines and a sundry assortment of practical enamelware. Today the hard chairs have given way to restful waiting rooms, psychologically appointed, and a series of rooms filled with awesome gadgets and mechanical monsters of stainless steel, chrome, glass and colored lights. Gone are the shelves of pills. The druggists now handle these in large assortments. To transfer the mystery of life from rows of pills to awesome gadgets has cost the patient a lot of money. Yet he now demands it. And the more money the patient has, the more wizardry he demands.

That the introduction of these machines has contributed to life and happiness, there can be no doubt. It has contributed also to the cost of medical care. Every invention of new technics in medical procedures, every discovery of new drugs and appliances at least initially increases the cost of medical care. Their ultimate economic effect may be to lessen the seriousness of certain diseases and

actually to increase the life span. But then—it costs money to live!

What is true of physician's equipment is also true of clinics and hospitals to an even higher degree. Hospital and clinic facilities must be modern and up-to-date. Every new discovery renders obsolete some equipment. With the rapid advances made in new discoveries, hospital and clinic costs have had to rise sharply.

From an insurance standpoint, this fluctuation in inventiveness, added to the inflationary trend during the past years, makes the problem of providing a stable premium structure almost impossible. All the statistics in the world cannot solve the potential that premiums either have to be too high to begin with, or premiums will have to be adjusted upward in future years.

This leads to the third and perhaps the most delicate problem of all, instability of medical fees.

The personal relationship between the patient and his physician is in theory and, I believe, in practice one of the most confidential under our form of society. This relationship is fundamental to the art of healing. Without it, neither the patient nor the physician could build up the necessary trust to begin the art of healing. Hence, anything that would disturb that relationship, no matter how good in itself, must not be undertaken.

As a result of this confidential relationship, the fee charged by the physician also is of a quasi confidential nature. These fees are generally based on two considerations: first, the amount of services necessary to effect the cure and, second, the financial ability of the individual to pay. To this has been added the consideration of the degree of specialization needed to treat effectively a specific condition. From the standpoint of pure economics, this situation contains a contradiction. In no other private field does one person have to pay more for a given service than the other merely by reason of the fact that he may have more money than the other.

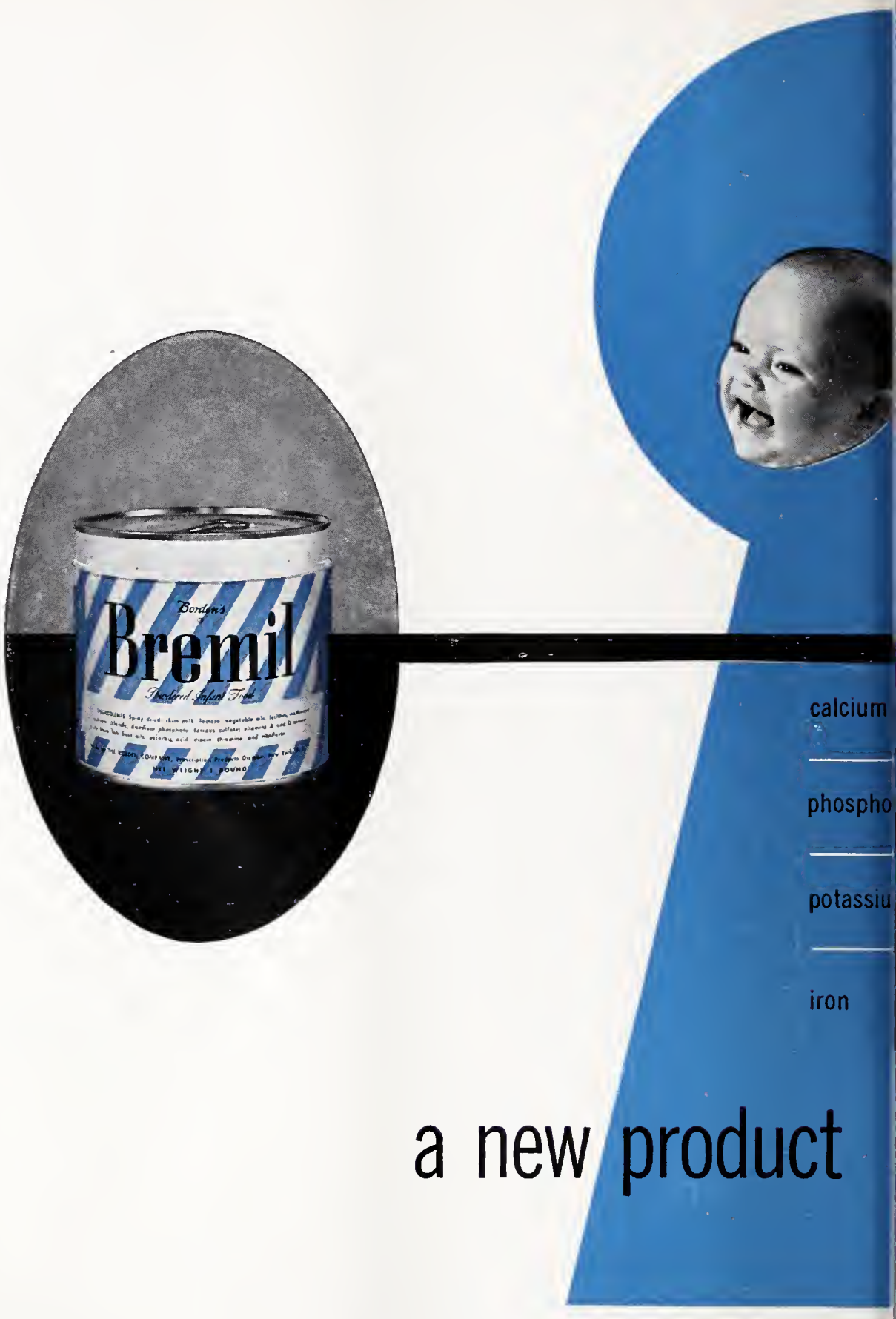
From the standpoint of the medical practitioner, the theory makes sense in that it enables him to obtain a certain degree of economic security and affords an opportunity for him to give much medical care at less than cost for those who otherwise could not obtain such services. The difficulty, however, arises principally from the fact that in certain instances physicians overestimate a man's true economic worth or, as sometimes happens, by reasons of a particular physician's ineptitude in understanding the true nature of an individual's financial position, fees are charged which cause a considerable hardship on the patient.

Medical societies have made a major effort to cope with this problem at the local level without deteriorating the personal relationship between the physician and the patient. In practically every medical society there have been many discussions regarding fee schedules. In many communities at a county and, in some communities, at a state level, physicians have tried to establish levels of fees which would represent maximum fees for people within certain specified income groups. These commitments by physicians to specified fee schedules have not been made without sacrifices on the part of many physicians. Thus, for example, a physician may agree to accept as payment in full, $100 for the performance of an appendectomy. For the routine appendectomy, $100 represents an equitable fee. A particular situation may arise, however, from an unusual complication involved in an appendectomy that may require many hours of work in which the highest type of skills are necessary, the reputation of the physician is at stake, and the life of patient held in the balance. In such instances, the $100 fee may represent not even a reasonable return on the time that has to be spent by the physician. Yet, he agrees to accept the $100 if the patient's income is within a specified limit. For those over that limit, the physician allows himself to charge an additional fee, again in proportion to the individual's ability to pay. When the individual's ability to pay is quite high, a quite high fee may result.

Again, the high degree of specialization necessary to cope with the advancements made in medical science have made the costs of becoming and being a specialist higher. As a result, he must charge higher fees in order to carry on as a specialist. The greater the ability of the patient to pay, the more specialization he will demand.

In trying to develop such a plan of insurance to accurately measure the liability involved, the premium structures under this system would have to be based upon ability to pay. In other words, for $5,000 of medical insurance, the man with the income of $5,000 would pay one price and the man with the $10,000 income would pay approximately twice as much for the same service. While this theory of costs has been accepted in the charging of medical fees, it has not been accepted in the field of insurance.

The final problem results from much propaganda regarding the low cost of medical care if it is done on a government insurance basis. In many state legislatures, at the federal level and in many political precincts there has been dispute after dispute on the proposition of a government insurance scheme. All these schemes have made surveys and the publicity accompanying these surveys has always indicated the solution of a major social problem by community cooperation in the pooling of a few pennies a day. The pooling of two pennies a day results in $7.30 per year. Seven dollars and thirty cents per year will pay for two calls to a physician in an office. It will pay for less than one visit made at night at the home. It will require the pooling of twelve individuals to pay the surgeon's fee for one simple appendectomy. From what I know of medical costs in looking at bills day after day, these statements of a few pennies a day are an open mis-


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1. Gardner, L. I., Butler, A. M., et al.: *Pediatrics* 5:228, 1950.
2. Nesbit, H. T.: *Texas State J. M.* 38:551, 1943.
3. Dodd, K., and Rapoport, S.: *Am. J. Dis. Children* 78:537, 1949.
4. Recommended Daily Dietary Allowances, Revised 1948, Food and Nutrition Board, National Research Council.

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representation made with the definite purpose of deceiving the people.

Strangely enough, this propaganda has taken its toll even among the high income groups whose good common sense should tell them better. When one speaks to people about medical bills for illnesses that run from $1,000 to $10,000, they think of the rare situation which they are sure will never happen to them. The facts are, however, that those situations are not rare. In a group of 2,500 men earning $5,000 a year and over, fifty-five had serious illnesses within one year. The average expense incurred was more than $1,200. Four of them before they get through will run expenses to $5,000. Similarly, on the wives of these same men during a period of seven months, one out of fifteen insured incurred medical expense in excess of $700. One man incurred medical expense of $7,800 on his wife during that one period. The fact is that where life is considered of great value, the costs of maintaining it can be exceedingly high. To hide behind the false assurance that "it cannot happen to me" is just plain stupidity. Yet the statement most frequently made by people in a higher earning classification when one speaks to them about a premium of $54 per year which includes coverage for dependents under our new catastrophe medical program is "your price seems to be entirely too high." The propaganda of the few pennies a day is taking its toll.

In spite of these obstacles, we have tried to make the beginning in working out an answer to the problem. An experiment on a group insurance basis rather than on an individual policy basis held greater promise of getting a true picture of experience. A survey of existing group plans indicated that the average group insurance plan would provide between $300 and $500 to pay medical and hospital expense. Thus, by setting the deductible at $300, we avoid disturbing the underlying group insurance plan, while at the same time we avoid duplication of coverage to any substantial degree.

The next problem was a definition of medical expense. We took a broad view of this, and included every item of care prescribed by a physician for the cure and rehabilitation of the patient. We incorporated in policy language two provisions: (1) The charges must be reasonable; (2) the service must be necessary. It is evident at once that, at least theoretically, these provisions place a considerable degree of authority in the insurance company in administering the program. From the language itself, it would seem that we had the power to deny liability merely by declaring the charges unreasonable, thereby setting ourselves up as arbiters of medical fees, or denying liability by declaring the services to be unnecessary, thereby setting ourselves up as judges of the quality and character of medical care.

From a practical standpoint, however, no such interpretation is possible. A reasonable charge we understand to be one that would be charged under similar circumstances by good hospitals, physicians and nurses residing in the same area.

We could not deny liability even though we had reason to believe the expense incurred was unreasonable. As an insurance company, we have an obligation to our policyholders to see that their interest, as well as ours, is protected, and in an experiment of this type which has deep social and economic implications, we would be remiss in our job if we permitted this plan of insurance to result in nothing more than an occasion for increasing costs without a return in increased health and physical well-being. When we have reason to believe that charges are unreasonable, we intend to approach those who made the charges through established channels and try to win their cooperation in building a sound system, not destroying it. This is an ambitious program of service, but through cooperation of appeal machinery set up by a majority of medical associations, we know it can be done.

Similarly, we intend to act when medical services are rendered, which in the judgment of other good physicians in an area are considered uncalled for. Here, again, our estimate of what is proper will not warrant denying liability. We do, however, intend to get such medical evidence as is necessary to support our position and with it seek to win cooperation from the persons involved.

Insurance regulatory authority to date has gone along with this underwriting concept. Only in one state has an insurance official objected to the language used as placing too much power in the hands of the insurance company. I believe that even in this state we will be able to demonstrate the correctness of our position in the use of this language. I personally feel that should we fail to persuade this official of our position, we would do better to not try to write any business in that state rather than revamp the language merely to pay benefits irrespective of the reasonableness of the charges or the necessity of the care provided. For instance, I do not believe in having medical care insurance carry the burden of buying a motor driven wheel chair for a physically well man whose only need for such a contraption is that he has a yen to ride up and down the street in such a contraption, and some physician who refuses to be pestered to death by the fellow, decides to humor him by authorizing the use of such a machine.

The second important underwriting concept in our plan is that we pay 75 per cent of the medical costs in excess of the deductible, not 100 per cent. By doing this, the patient has a financial stake in both the amount and quality of service rendered and the charges made for those services. To pay the entire cost, in view of the whole economic problem involving the cost of medical care, could destroy the possibility of ever working out a solution. To me, it seems axiomatic that one cannot ever establish a reasonably level set of premium rates when the claim costs are completely dependent upon an open end proposition that invites peo-

ple to build up costs to whatever the traffic will bear. Unfortunately, there are in the business some underwriters who follow the theory of blind chance, preferring to hope that everything will turn out all right instead of honestly admitting ignorance or facing the facts as they exist. The public suffers from that type of underwriting.

This type of coverage is experimental. It is our fond hope that other employers who believe in the need for a solution of this problem will cooperate with us in this experiment by making it available to people in specified earnings brackets. Through this cooperation, we can build the statistics necessary to broaden the plan so that in time the entire population can be benefited. But in adopting the plan, those covered must recognize its experimental character. Any insurance representative, or any company that at present would try to make you believe that they have the definite and final answer to this problem would be openly convicting themselves of being fools.

The experience gained to date, which experience is admittedly meager by reason of the short period of time involved and limited exposures, would indicate that there is a basic difference in loss costs between this type of coverage and that found on regular group insurance. Under regular group insurance, if the premium for the employee is $1, the premium for the wife and children should be $2 to $2.50 depending upon maternity benefits provided. Under the catastrophe coverage plan, while the frequency of claims on the wife is a little more than twice the frequency on the male employee, the average cost per claim on the wife is one half as high as the cost per claim on the male employee. This is due, I believe, in great part to the high frequency of the surgical operations involving female organs. The theory of "cheaper by the dozen" applies here. Medical costs on children rarely go over $300. While we know of cases, such as polio and especially congenital deformities that can run into thousands of dollars, their frequency does not substantially change the cost structure. Because of this situation and because we believe in the ultimate objective of the family package at a uniform price, we set the dependent premium at the equivalent of the employee premium. Whether or not this preliminary evaluation will be born out by future facts yet remains to be proven.

To give you an idea of how these plans are set up, I have made available to you a copy of our latest literature—"Personal Medical Disaster."

This whole subject is a great concern to the insurance industry. We have received many requests for detailed information. As one underwriter stated it, "The industry needed to find the answer to catastrophe coverage for a long time, but we always managed to find other things to do. Now that Liberty Mutual has made the start, we have to do something about it."

One company has originated a plan tied in with its group insurance plan which provides that if by reason of injury or illness the insured incurs medical expense, the plan will pay the expense, up to $5,000, which is in excess of the benefits paid by the basic group plan and an amount paid by the insured himself equivalent to one month's salary. The fundamental underwriting concepts of this plan are good. It recognizes the basic problems involved. The element of coinsurance is well satisfied. The plan should provide a low premium outlay. Whether men in general will buy a deductible of such size is the question.

The suggestion has been made that instead of a flat deductible, the plan be tied in with the existing group insurance plan. This would be desirable in many instances but, because of the many variables that exist in the individual group insurance plan, and because the statistics are so thin on catastrophe coverage, it would at least at the present time be impossible to properly evaluate rate-wise the difference that would be created by the variations existing in group insurance plans. Until such time then as rate structures become more firm, it would seem desirable to write the coverages on a flat amount deductible basis.

Also the suggestion has been received in a number of instances that instead of providing catastrophe coverage for all diseases, we list the diseases specifically for which we would provide reimbursement. Thus, there would be cancer, tuberculosis, heart disease, mental disease and such other serious illness as can be accurately diagnosed. The difficulty with such a specific program, however, is that a person who was unfortunate enough to develop some kind of rare disease not spelled out in the policy would have no benefit. Thus, for example, under the plans that we have written to date one man incurred medical expense to the tune of $3,800 for an infection of an eyeball.

One company has come out with a plan carrying a $100 deductible and paying the entire medical cost from $100 to $5,000 per case. The premium structure in accordance with the brochure I saw called for $3.50 per month for the employee, $3.50 a month for the wife, $1.00 a month for the child, and $1.00 a month for the second and all other children. Thus, a man with wife and two children would be paying a premium of $9.00 a month or $108 per year. It is my belief that under a plan so loosely drawn, should such coverage become widespread, the cost would have to be increased substantially by reason of this plan's potentialities to increase the costs of medical care.

It has been extremely interesting to participate in the development of this type of coverage. I hope that the development as it appears will show that we have been working in the right direction. I know that we cannot solve the problem alone. If, through our diligence in pursuing a worth while objective we can merit the confidence of forward looking management in American industry and can get the cooperation of medical associations, we can ultimately achieve a satisfactory solution.

PRESIDENT'S PAGE

Each spring brings among other new things another President for the Missouri State Medical Association and as such I would like to extend my greetings to all the members, families and friends of this society.

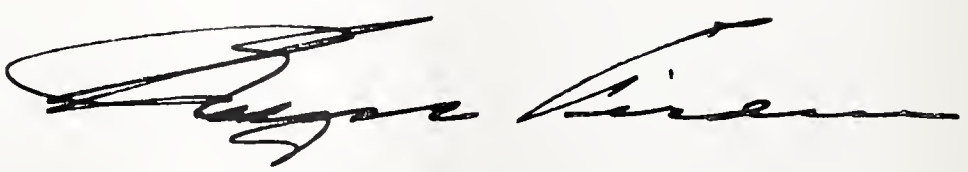


There are many things I would like to discuss with you, things of current debate, the changing times and how they affect the practice of medicine, things which would take many hours of discussion and pages of writing, but this one page allocated to me can be only a brief beginning and for this moment I shall content myself by trying to implant a thought in your consciousness which I hope will in time weld us into a cohesive dominant group playing our part in the future development not only of medicine but in all phases of American life. This is entirely possible as the many incidents throughout the country in the last several years have definitely proved. In the past we as physicians have deemed it sufficient to confine our activities to the practice of medicine, but now we have suddenly found ourselves confronted with proposed revolutionary legislation and ideas which demand our attention if we are to continue the orderly development of the brilliant medical saga of the last century.

The little man on Main Street knows the promise modern medicine holds for him, and he has demanded a part of it, a demand which a few would use to increase the power of our already cumbersome and too expensive bureaucracy.

We should grant that all the right may not be on our side and we cannot and should not ignore what Main Street needs and wants. We should recognize the inevitability of changes in customs and practices in all walks of life, ours along with the others. There are many who would give up and let anyone reorganize the profession any way he likes, but if we listen to them we have lost our rights to a voice and we are no longer free.

To keep our right to guide the future development of medicine and America demands more than just being a physician. Your neighbor's problem becomes your problem. You must be a citizen first; you must be active in your civic and medical organizations; you cannot leave everything to some medical society officer or lay secretary to do for you. This is your society, your country—the future is at least partly in your hands.



Editorials

ANNUAL SESSION

The Ninety-third Annual Session and the printing of this issue of THE JOURNAL are coincident, therefore nothing concerning the Annual Session can be reported. Appointments on committees for the terms expiring this year are made at the session and new officers elected. For this reason the "Officer and Committee" page is omitted from this issue.

News of the Session will be given in the June issue and new officers and committees announced. The minutes of the House of Delegates will be published in the July issue of THE JOURNAL as in former years.

NARCOTIC ADDICTION IN CHILDREN

The following editorial is reprinted by permission from the March 30 issue of *The Bulletin of the St. Louis Medical Society.*

"CRUM-BUMS

"The daily press is reporting, with increasing frequency, the incidence of narcotic addiction among mere children. To find a name for a character so contemptible that he would peddle dope to kids we must turn to the lexicon of the kids. To them, the lowest form of human life is a 'crum-bum.' Much worse than an ordinary bum, more despicable than any other type of crook, much more dangerous than the small-time hoodlum—the narcotic peddler who trafficks with the teenager is the worst crum-bum of the lot. His rank in the genus *homo* is comparable only to that of the slimy, crawling things that inhabit the undersurface of rocks in the remainder of the animal world. A creature so completely bankrupt of moral principles that he would encourage narcotic addiction in children, to the end that they must steal, lie, cheat and prostitute themselves in order to purchase the stuff has sacrificed his right to live among decent people.

"What place does this diatribe have in a medical publication, you ask? Simply this, only the doctor knows, better than anyone, the mental and physical agony that the addict endures. The doctor has seen, more than anyone else, the abject misery and the stripping-away of conscience, virtue, morality and standards of human relationships engendered by the the craving for narcotics. It is fitting and proper, therefore, that the physician—who bears the same responsibility to community health that the lawyer does to community law and order—raise his voice in protest against this horrible and revolting development in our modern society.

"We quote a headline from a recent newspaper story: 'Couple Gets Five Years for Dope Peddling.' Five years! And they may be free in two, or two and a half, or three years. Free to go back to where they cached the $270,000 they made in six months selling herion. What crum-bum—or for that matter, a higher order of bum—would not be willing to spend three or even five years in the pokey for that kind of money? The same edition stated that Al Capone's brother faced sixteen years for tax evasion; a writer of rubber checks was sentenced to six years in another story in the same edition. But for a couple who had murdered the souls and minds and futures of kids; who had helped rob them of the opportunity to grow into healthy, happy, ambitious citizens of a community where they could walk proudly with their fellows—five years.

"This is in no sense an indictment of the judge who pronounced sentence, for—again we quote—this was 'the maximum time the court could impose.' If five years constitute the maximum time that a judge is permitted to put away these termites of our social structure, then it is high time that the lawmakers reexamine relative values. If spies, saboteurs and other traitors to our country can be given life sentences, then those who would sabotage the children upon whom the nation's future depends should be given life sentences. If a murder can be given the electric chair, then those who would create thieves, murderers and prostitutes deserve no less. Something drastic should be done to protect these kids! JIS."

FATAL ACCIDENTS AMONG INFANTS

For well more than a decade, little progress has been made in reducing the mortality from accidents among infants in this country. The death rate among children less than 1 year of age was only 2 per cent lower in 1946-1948 than in 1933-1935. This figure contrasts greatly with that for the causes of death other than accidents, which in the same period showed a drop of 44 per cent among infants.

In order to learn how and where babies lose their lives in fatal mishaps, the Metropolitan Life Insurance Company analyzed the information available from the death claim records of infants insured in the company's industrial department who died from accidents in the years 1945-1949.

There were 709 deaths of infants less than 1 year of age from accidents in this period, 40 of them less than 1 month, 450 from 1 to 5 months and 219 from 6 to 11 months.

The greatest cause of death was mechanical suffocation which accounted for 350 of the 709 deaths. Mechanical suffocation included 138 deaths from obstruction, suffocation or puncture by ingested objects; 22 from strangulation; 29 from burns; 52 from conflagrations; 36 from falls; 29 in motor vehicles; 11 from ingestion of poisonous solids or liquids; 10 from drowning; 8 from absorption of poisonous gas, and 24 from miscellaneous causes.

Organization and Economics

NEWS

Missouri members who attended the 14th annual meeting of the New Orleans Medical Assembly, March 5 to 8, are Drs. Maxwell G. Berry, Ralph R. Coffey, W. Wallace Greene, Frank Hogue, Phillip H. Halperin, Louis Kovitz and John H. Wheeler, Kansas City; Norman W. Drey, St. Louis; D. B. Elrod, Albert M. Estes, Charles T. Herbert, Paul B. Nussbaum, William F. Oehler and Glenn J. Tygett, Cape Girardeau; M. C. Johnson, Richmond; James O'Donoghue, St. Joseph; Eugene Robichaux, Excelsior Springs; Harry D. Silsby, Springfield, and Charles A. Lusk, Jr., Butler.

Ira H. Lockwood, M.D., Kansas City, has been elected commissioner for the Ninth District on the Blue Shield Commission.

Claude J. Hunt, M.D., Kansas City, was a guest speaker at a meeting of the Oklahoma Surgical Society in Oklahoma City, March 21. He spoke on "Acute Bowel Obstruction." On March 22 he spoke at the University of Oklahoma Tumor Clinic on "Cancer of the Colon."

J. A. Dickson, M.D., and Willis Hall, M.D., St. Louis, held an informal reunion in celebration of the seventieth anniversary of their graduation from Washington University School of Medicine on March 5.

A plaque in memory of the late Wallis Smith, M.D., Springfield, will be placed in Stone Chapel at Drury College, according to Dr. J. F. Findlay, president of the college.

W. A. Bloom, M.D., Fayette, has been appointed to serve on the credentials committee of the International College of Surgeons.

Max Goldman, M.D., Kansas City, was honored at a reception held March 25 at the Muehlebach Hotel, Kansas City, in honor of his fiftieth anniversary in the practice of medicine in Kansas City.

Edward D. James, M.D., Joplin, was presented with gifts by the Jasper County Medical Society at a meeting on March 13 in honor of his eightieth birthday.

The Missouri State Board of Medical Examiners will give examinations at St. Louis University on May 30, 31 and June 1, and at Washington University on June 7, 8 and 9.

Emmett F. Hoctor, M.D., Farmington, was the guest speaker of the Fredericktown Parent-Teachers Association on April 17.

Joseph L. Fisher, M.D., St. Joseph, addressed a class for first aid Red Cross instructors at St. Joseph on March 29. He gave an illustrated talk on civil defense.

Graham Asher, M.D., Kansas City, spoke before the Excelsior Spring Rotary Club March 23 on "You Can Live Even Longer."

Robert S. Minton, M.D., St. Joseph, and Walter L. Brandon, M.D., Poplar Bluff, were appointed to the state advisory council on March 26. The council acts in an advisory capacity on applications for federal aid to build or expand hospitals of health centers.

Earl M. Rush, M.D., New Bloomfield, was surprised by a buffet dinner at the New Bloomfield school building on March 27 given in honor of his anniversary of fifty years in the practice of medicine.

W. A. Bloom, M.D., and W. J. Shaw, M.D., Fayette, celebrated the twenty-fifth anniversary of their reopening of the Lee Hospital at Fayette on April 1.

MUSINGS OF THE FIELD SECRETARY

March saw the first patients admitted to the new sixty-five bed Phelps County Memorial Hospital at Rolla, the first hospital constructed under the Hill-Burton Hospital Construction law to be opened in Missouri.

April saw the opening of the new fifty bed Perry County Memorial Hospital at Perryville. The Dunklin and Pemiscot County hospitals are expected to be open by early summer. All four of these institutions are recipients of one third of their construction costs from federal funds under Public Law 725. The other two thirds of construction costs came from local county bond issues.

The Bonne Terre Hospital has recently opened a new wing and is now remodeling the older part. When completed this will be, essentially, a new seventy-eight bed institution.

These added hospital facilities portend the fulfillment of many dreams and the satisfying of an important need in the localities involved.

The Missouri Public Health Association will hold an annual meeting at the Governor Hotel, Jefferson City, on May 7, 8 and 9. The third day, May 9, will be taken over by the third state-wide annual health conference sponsored by the Missouri Health Council. The program of this conference is printed elsewhere in this issue of THE JOURNAL. C. Edgar

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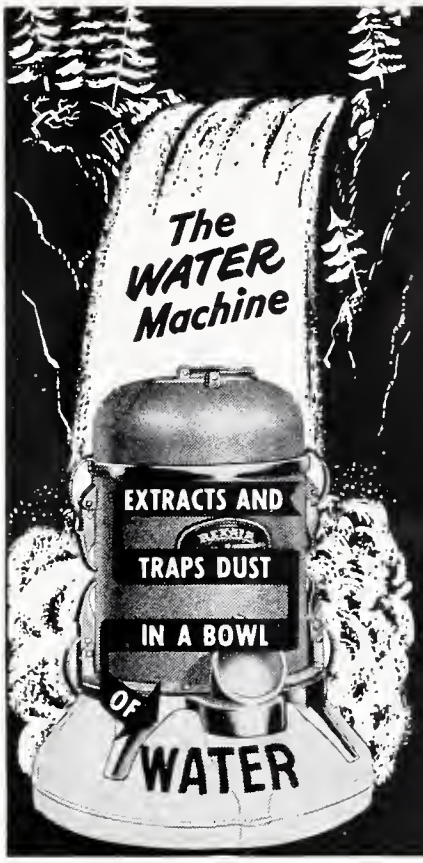
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• Pictured at left — Most comfortable homes for individuals requiring rest, scientific diagnosis and treatment. Fireproof construction.

Virden, M.D., Kansas City, President of the Missouri State Medical Association, and Mr. Basil O'Connor, New York, President of the National Foundation for Infantile Paralysis, will headline this one day health conference session. The conference last year registered some four hundred people representing all sections of the state. The anticipated attendance this year will top that of last. It is hoped that many physicians over the state will make plans to be present. This conference has as its major aim the dissemination of information and inspiration which will be used on the local level to improve local health conditions.

On May 17 at the Bothwell Hotel in Sedalia, the third annual meeting of the Missouri Academy of General Practice will take place. The program for this session appears in this issue of The Journal. Indications point to a great amount of interest in this year's program. In addition to the carefully planned scientific program, an interesting look at some things and some people in the nation's "policy-drought" Capital should be in store through "White House Panorama" as revealed by Wallace Graham, M.D., personal physician to the President. All members of the Missouri State Medical Association are cordially invited to attend all or any part of this one day meeting.

NEW MEMBERS

Allen, Robert E., M.D., Kansas City.
Baum, Frank E., M.D., Kansas City.
Boldt, Thomas H., M.D., St. Louis.
Curl, Howard, M.D., Joplin.
Dixon, Vewiser L., M.D., Kansas City.
Elliott, Gladden V., M.D., St. Louis.
Fitzpatrick, Thomas J., M.D., St. Louis.
Goodrich, D. Wells, M.D., St. Louis.
Hale, Ralph, M.D., Kansas City.
Hanlon, C. Rollins, M.D., St. Louis.
Huggins, Albert M., M.D., St. Louis.
Hunter, James R., M.D., Fulton.
Katz, Milton, M.D., Kansas City.
Kaul, Philip G., M.D., Kansas City.
Kiyasu, Robert K., M.D., St. Louis.
Kozal, Francis L., M.D., Salem.
Lanier, Andrew S., M.D., Fulton.
Lanier, Patricia F., M.D., Fulton.
McCanse, Raymond A., M.D., Kansas City.
McDonald, Bruce P., M.D., Kansas City.
Noltensmeyer, Milton N., M.D., Kansas City.
Papp, Sandor D., M.D., Joplin.
Peterson, Carl McKee, M.D., Kansas City.
Peterson, Walter R., M.D., Kansas City.
Ramos, John F., Jr., M.D., Kansas City.
Rodgers, Samuel U., M.D., Kansas City.
Saylor, Robert King, M.D., Webb City.
Schlenker, John L., M.D., St. Louis.
Shofstall, William H., M.D., Kansas City.
Siniscal, A. A., M.D., Rolla.
Suarez, Nelson, M.D., Pilot Grove.
Weiford, Edward C., M.D., Kansas City.
Williams, Luke E., M.D., Kansas City.

DEATHS

Glasgow, Marvin C., M.D., Cardwell, a graduate of the University of Arkansas, 1939; Fellow of the American Medical Association; member of the Dunklin County Medical Society; aged 42; died January 28.

Chandler, John F., M.D., Oregon, a graduate of the Kansas City Medical College, 1895; member and past president of the Holt County Medical Society; aged 85; died February 19.

Lieberman, B. Albert, Sr., M.D., Kansas City, a graduate of the University Medical College of Kansas City, 1895; Fellow of the American Medical Association; honor member of the Jackson County Medical Society; aged 77; died February 25.

Haile, Leon C., M.D., St. Louis, a graduate of the University Medical College of Kansas City, 1920; Fellow of the American Medical Association; member of the St. Louis Medical Society; aged 57; died February 26.

Grace, John F., M.D., Excelsior Springs, a graduate of the Medico-Chirurgical College of Kansas City, 1903; honor member and past president of the Clay County Medical Society; aged 73; died March 3.

Crossen, Harry S., M.D., St. Louis, a graduate of Washington University School of Medicine, 1892; Fellow of the American Medical Association; honor member of the St. Louis Medical Society; aged 82; died March 10.

Bartlett, Ezekiel M., M.D., Clarksville, a graduate of the University of Louisville School of Medicine, 1900; honor member and past president of the Pike County Medical Society; aged 73; died March 15.

Althans, Carl, M.D., St. Louis, a graduate of Washington University, 1903; Fellow of the American Medical Association; member of the St. Louis Medical Society; aged 70; died April 1.

Scheele, M. H., M.D., University City, a graduate of St. Louis University School of Medicine, 1909; Fellow of the American Medical Association; member of St. Louis Medical Society; aged 67; died April 2.

MISSOURI ACADEMY OF GENERAL PRACTICE

The Third Annual Meeting of the Missouri Academy of General Practice will be held at the Bothwell Hotel, Sedalia, on May 17. The meeting will begin at 9:30 a.m. with a business session followed by a luncheon meeting at noon. The scientific program will begin at 1:00 p.m. as follows:

1:00 p.m. The Acute Abdomen, Melvin A. Casberg, M.D., Department of Surgery and Dean of the Medical School of St. Louis University.

1:30 p.m. Discussion by Wallace H. Graham, M.D., Washington, D.C.

2:10 p.m. Abdominal Pain in Childhood, George V. Herrman, M.D., Department of Pediatrics, University of Kansas Medical School.

2:30 p.m. Indications for Hysterectomy, Willard Allen, M.D., Department of Obstetrics and Gynecology, Washington University Medical School.

2:50 p.m. Discussion.

3:10 p.m. The Management of Common Eye Disorders, Claude R. Bruner, M.D., Department of Ophthalmology and Otolaryngology, University of Missouri.

3:30 p.m. The Management of Common Proctological Conditions, R. Hackmeyer, M.D., Department of Surgery, St. Louis University Medical School.

3:50 p.m. Discussion.

4:10 p.m. Diagnostic Drifts, Deceptions and Common Misses, M. Pinson Neal, M.D., Department of Pathology, University of Missouri.

4:30 p.m. The Practical Management of Varicose Veins, Eugene M. Bricker, M.D., Department of Surgery, Washington University Medical School.

4:50 p.m. Discussion.

7:00 p.m. Dinner Meeting, White House Panorama, Brig. Gen. Wallace H. Graham, Washington, D. C.

PHELPS COUNTY MEMORIAL HOSPITAL

The new Phelps County Memorial Hospital is now an operating reality. This sixty-five bed institution, located in Rolla, received the first patients on March 19, 1951. It is the first hospital in the State of Missouri built under the provisions of the federal Hill-Burton Act.

The hospital was built and equipped at an approximate cost of $700,000 which includes $400,000 raised by a county-wide bond issue three years ago. More than $200,000 was received from the federal government, under public law 725, for its construction. Additional funds were raised from private contributions and foundation grants to make available in this institution maximum facilities for saving lives and bringing better health to the community.



Members of the Board of Trustees. Standing are Mr. Oscar Glenn, St. James; Mr. Rex Z. Williams, Rolla; Mr. Frank Blue, Rolla, vice president; seated are Dr. M. K. Underwood, Rolla, president; Mr. William Mueller, Rolla, secretary.

A trained hospital administrator is on the job as the active manager. Twelve registered nurses and fourteen practical nurses were on the roster at the opening on March 19. Membership on the medical staff is determined by the hospital board of trustees who receive recommendations from the Phelps-Crawford-Dent-Pulaski Counties Medical Society.

This ultra-modern three story fireproof hospital is the greatest community-wide achievement ever



Phelps County Memorial Hospital

consummated in Phelps County. It stands as a splendid monument to that priceless spirit of local initiative.

MISSOURI HEALTH COUNCIL

The third annual conference of the Missouri Health Council will be held in the Ballroom, Hotel Governor, Jefferson Sity, on May 9. The following program will be presented:

10:30 a.m. Address of welcome, Mr. B. W. Harrison, Columbia.

10:45 a.m. "We Are on the Right Track," C. Edgar Virden, M.D., Kansas City, President, Missouri State Medical Association.

11:15 a.m. "Fundamental Values of Health Councils," Mr. Basil O'Connor. New York, President, National Foundation for Infantile Paralysis.

1:15 p.m. "Report on a Survey of the Missouri Division of Health," Mr. Chester Starr, Jefferson City, Director, Rural Health Service, Missouri Farm Bureau Federation.

1:45 p.m. "Presentation of Questionnaire for Use of Local Health Councils," Dr. Robert McNamara, Columbia, Department of Rural Sociology, University of Missouri.

2:15 p.m. "A County Health Council in Action," C. S. Linton, M.D., Kennett, President, Dunklin County Health Council.

2:45 p.m. Summary, Mr. Ray McIntyre, Field Secretary, Misouri State Medical Association.

COMMITTEE ON HEALTH AND PUBLIC INSTRUCTION

Vincent T. Williams, M.D., Kansas City, spoke on the Health Forum lecture series sponsored by the Woman's Auxiliary of the Buchanan County Medical Society at the Hax Art Center, St. Joseph, on March 8. His talk on "Health Hazards" was well attended and well received. On April 12, the final lecture of this season's series was delivered by Melvin A. Casberg, M.D., St. Louis, Dean of the St. Louis University School of Medicine. Dr. Casberg spoke on "Growing Old Is Up to You." The Health Forum lecture series is a public relations project of the Buchanan County Society Auxiliary which is proving quite popular.

The Woman's Auxiliary to the Jefferson County Medical Society, on March 9, sponsored a health forum lecture and tea at the Methodist Church at Festus. Representatives of various women's clubs and organizations in the county were invited guests. Robert J. Mueller, M.D., St. Louis, spoke to the group on "So You Have a Headache." Numerous questions were asked by the audience following the formal lecture. Seventy-five people attended.

On April 6, at the Frederick Hotel, Boonville, one hundred forty-five people attended a public relations tea given by the Woman's Auxiliaries of the Cooper and Howard County Medical societies. Mr. Hartley Pollock, attorney, St. Louis, spoke on "Socialized Medicine—A Crossroad." Women's clubs and organizations from both counties were well represented. A good number of business and professional men of Boonville also attended as well as a group of premedical students of Kemper Military School. This was the first meeting of its type sponsored by these auxiliaries.

TIMELY OBSERVATIONS

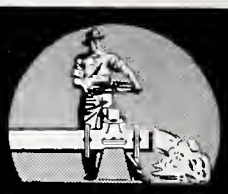
Socialized medicine was entertainingly discussed in a column entitled "Time Observations" in the St. Joseph *News-Press* of March 28. The column follows:

"Why the Private Practice of Medicine Furnishes the Country With the Finest Medical Care." That is a subject on which your humble correspondent is now a connoisseur. The reason whereof being that last night for more than two hours, instead of watching the Milton Berle or Billy Rose show on TV, he read high school essays. This is one of the privileges, or penalties, of being an editor. Someone has said the charm of being a newspaper man is that you meet such interesting people. The charm of being a newspaper man is that you get stuck as a judge in an essay contest at every turn of the moon. Yes, ladies and gentlemen, believe it or not, some of the finest people we have met in a stormy journalistic career (our Sigma Delta Chi emblem just arrived yesterday) have been—junior college deans and school superintendents and Catholic monsignori and ministers and rabbis with long strings of initials after their names, all contest judges.

No, good people, we are not going to regale you with any arguments pro and con we read last night. We already were against socialized medicine and deplore Little Mr. Big in Washington and Oscar Ewing, paternalistic Santa Claus of the Federal Security Administration. We wish Mr. T. and Mr. E. (who are buying their continued retention in public office as glibly, if not as brazenly, as the Praetorian Guard was bought centuries ago) would quit talking about national health insurance. It's socialized medicine. That's all. And it is ruining England and could ruin us. That is unless R. F. C. and some other affliction of a conscience-weary administration doesn't nose our winner.

But propper up in pillows—never read downstairs in the living room if you have the courage to go to your own wing of the house and shut the doors—mulling over what socialized medicine has done to England, as seen by these bright high school young men and women, we thought out our own essay on private medicine. This column today is dedicated to the St. Joseph men of medicine and surgery who belong to the Buchanan County Medical Society. Never in our memory has the code of ethics of St. Joseph's M.D.'s been as high as today. Never in our memory, in our private opin-

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From The Literature

- Bubert and Cook, Bulletin of School of Medicine, Univ. of Maryland, Vol. 32, pp. 175-190, 1948.
- Paul and Montgomery, J. Iowa State Med. Soc., June, 1948.
- Krantz, Holbert, Iwamoto and Carr, J.A.Ph.A., Vol. 36, pp. 248-250, 1947.
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ion, has the profession of medicine stood so high in this community in comparison with the other learned professions of which we claim, perhaps presumptuously, to be one.

We think now of a doctor we've known since we were a cub and he was starving in an office he shared with an older medic. He had a fair to middling practice when he went to the first World War. Never will we forget the time he made the AP wires from somewhere in Europe, operating at a base hospital while the enemy dropped bombs on the hospital. He came back with a practice assured.

We've known this doctor in fair weather and in foul and you can take that atmospherically or socially or temperamentally. He's never once forgotten his Hippocrates Oath. And never a man lived up to that oath more religiously. We ponder the marital pledge at God's sacred altar, the secret confession by humble sinner, the solemn oath by jurist as the bailiff cries "Hear Ye, Hear Ye, the Honorable, the United States Court is now in session. God save America and this Honorable Court." None is more binding than this simple oath this St. Joseph doctor took and day and night keeps.

He's the kind who snoozes, fully dressed, all night in the hospital waiting a delayed delivery. We have shaken his hand, when our own trembled at 1:30 a. m. at our front door when he, tie awry, hair mussed, showed how speedily he had left his warm bed. We remember once, a colleague was critical. This doctor abandoned everything and lived, actually lived, for days by the bed of his friend. The friend was saved. We've seen him with his laugh and his intimate interest in John and Bill and Jane and Ann. That chuckle of his, God bless him, was worth more than the prescription he read to the druggist over the phone.

Our doctor alone, you say? Not so, he's your doctor and yours and yours. For in the last month we have had occasion to talk to patients of other St. Joseph doctors. In each there has been that same intimate sympathetic interest, little proofs that it is not the money. It is the heaven-sent gift to heal. He may be in practice alone, he may be with a partner or two or three, he may be in a clinic. He is our doctor, not a ward heeler, picked peddler of pills, foist upon us by a creaky lets-get-more-jobs government.

Socialized medicine! National health insurance! Why quibble over a shibboleth? It was Kipling who said words are the most powerful drug used by mankind. Health insurance is simply socialized medicine and socialism is the black curse that leads to the destruction of everything on which our civilization rests. No thank you, we'll continue to call our family doctor. Let wayward Britons see their doctor at the courthouse or the city hall. We'll have none of it.

SOCIETY PROCEEDINGS

FIFTH COUNCILOR DISTRICT

J. F. JOLLEY, MEXICO, COUNCILOR

Callaway County Medical Society

The Callaway County Medical Society held a dinner meeting at the Fulton Country Club on March 15.

The regular monthly meeting was held at the office of W. J. Cremer, M.D., Fulton. The meeting was called to order by the president, J. C. Caldwell, M.D., Fulton.

A letter explaining the American Medical Association dues was presented.

Earl Loyd, M.D., Jefferson City, presented an interesting and informative paper on "The Use of Cortisone" which was followed by a general discussion.

Earl M. Rusk, M.D., New Bloomfield, was certified to the State Association as eligible for a fifty year pin at the April meeting.

R. N. Crews, M.D., Fulton, was presented a beautiful card autographed by members of the Society expressing congratulations and good wishes in recognition of his fifty-five years in the practice of medicine, the last fifteen of which he has served as secretary of the Callaway County Medical Society.

R. N. Crews, M.D., Secretary.

SIXTH COUNCILOR DISTRICT

R. W. KENNEDY, MARSHALL, COUNCILOR

Thirty-eight physicians and guests attended an evening dinner meeting of the Sixth Councilor District meeting at the Country Club, Clinton, on March 15. The Henry County Medical Society served as most cordial host. A social hour was held at 5:30 p. m. followed by dinner.

Following the dinner a scientific program was presented.

Mark M. Marks, M.D., Kansas City, spoke on "Rectal Medication" and "Plonidal Cysts."

Maxwell G. Berry, M.D., Kansas City, discussed "Cardiac Arrythmias—Their Treatment and Nontreatment."

R. W. Kennedy, M.D., Councilor.

NINTH COUNCILOR DISTRICT

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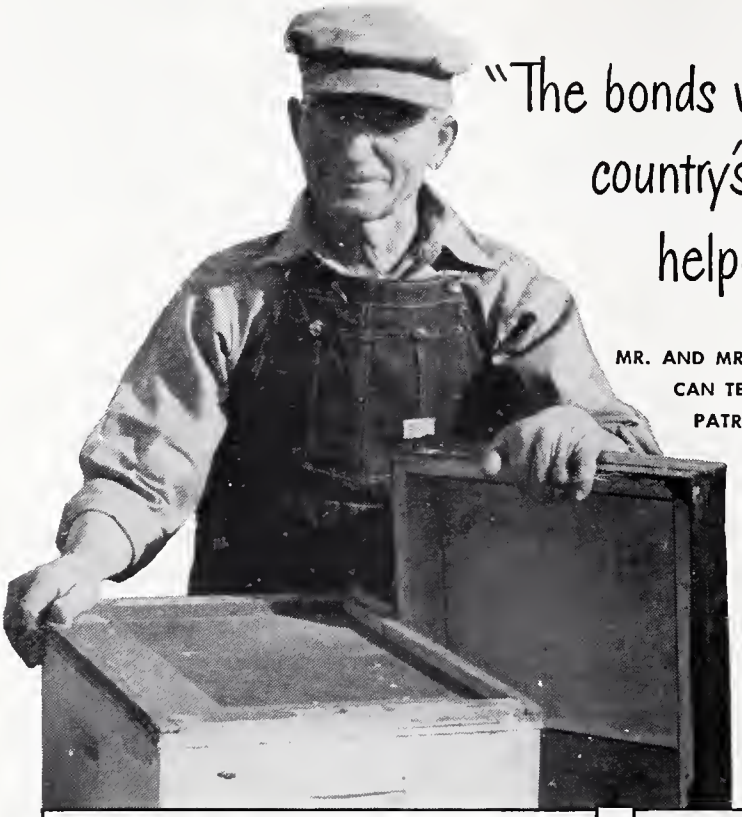
The South Central Counties Medical Society met at Cabool on March 21 with the following members and visitors present for dinner at the El Patio Hotel: Drs. R. W. Denney, S. W. Connor and A. C. Ames, Mountain Grove; Garrett Hogg, Jr., Cabool; T. J. Burns, Houston; M. D. Perkins, Willow Springs; E. C. Bohrer, Rollin H. Smith and C. F. Callihan, West Plains; Dallas D. Anthony, Springfield, and wives of most of the physicians.

The women were entertained at the home of Mrs. Hogg and the Society was called to order in Dr. Hogg's office by the president, Dr. Burns.

Dr. Anthony presented a number of x-ray films and gave much valuable instruction on their interpretation.

The meeting adjourned to meet in Willow Springs on May 16.

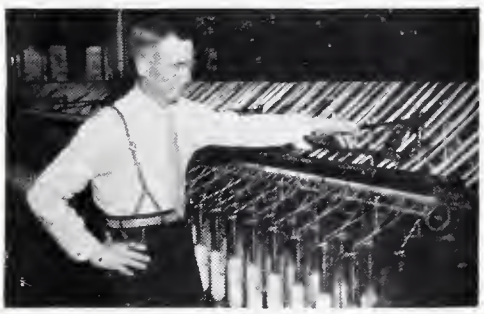
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Mineral Area County Medical Society

The regular monthly meeting of the Mineral Area County Medical Society was held March 31 at State Hospital No. 4, Farmington.

Julius Jensen, M.D., St. Louis, gave an interesting and valuable discussion on "The Treatment of Myocardial Infarction." A general discussion followed.

Members present were Drs. Dailey Appleberry, Ben M. Bull, F. R. Crouch, Marvin Grossman, J. W. Hunt, Marvin Haw, S. A. Lanzafame, H. M. Roebber, Van Taylor, George L. Watkins, Sr., and James J. Stout.

James J. Stout, M.D., Secretary.

COUNTY SOCIETY HONOR ROLL—1951

(Societies which have paid dues for all members and date placed on Honor Roll)

Benton County Medical Society—November 28, 1950

Camden County Medical Society—November 29, 1950

Perry County Medical Society—December 6, 1950

Miller County Medical Society—December 8, 1950

Mercer County Medical Society—December 12, 1950

Moniteau County Medical Society—December 16, 1950

Lewis-Clark-Scotland Counties Medical Society—December 20, 1950

Webster County Medical Society—December 20, 1950

Dallas-Hickory-Polk Counties Medical Society—December 28, 1950

Morgan County Medical Society—January 2, 1951

Holt County Medical Society—January 4, 1951

Pike County Medical Society—January 9, 1951

Harrison County Medical Society—January 10, 1951

Audrain County Medical Society—January 18, 1951

Montgomery County Medical Society—January 22, 1951

Scott County Medical Society—January 24, 1951

Lincoln County Medical Society—January 25, 1951

Henry County Medical Society—January 27, 1951

Howard County Medical Society—February 3, 1951

Stoddard County Medical Society—February 6, 1951

Bates County Medical Society—February 7, 1951

Marion-Ralls Counties Medical Society—February 20, 1951

Callaway County Medical Society—March 15, 1951

South Central Counties Medical Society—March 18, 1951

Ray County Medical Society—April 7, 1951

Newton County Medical Society—April 9, 1951

BOOK REVIEWS

RADIUM THERAPY. Its Physical Aspects. By C. W. Wilson, M.Sc., Ph.D., F. Inst. P., Physicist in the Department of X-ray and Radium Therapy, Westminster Hospital. Second Impression. Chapman and Hall Ltd., 37 Essex Street, W. C. 2, London. 1948. Price $6.00.

This small handbook of 224 pages covers practically all of the physical features involving x-ray and radium as related to therapy. It is related in a clear, concise manner in logical sequence, which should be welcome to the radiologic physician. There are still many awe-inspiring formulae but these seem to have been held to an irreducible minimum; the context remains clear when these have been deleted or assumed to be correct by the reader.

It is well illustrated with ninety-seven figures and charts which really demonstrate the problems in question.

The subject matter covered is sufficiently extensive to afford a truly satisfactory knowledge of the subject for the radiologist.

The subjects covered are: "Radium—Its Properties and Application to Medicine," "The Interaction of High-Voltage Radiation and Matter," "Gamma Ray Dosimetry—Methods and Theory," "Gamma Ray Dosimetry—Apparatus for Dosage Measurement," "Radium Therapy with Surface Applicators (Plaques)," "Cavitary and Interstitial Radium Therapy," "Radium Teletherapy," "Protection."

This small handbook should be welcomed by the radiotherapist as a convenient and efficient volume, not only for teaching of radiologic residents but for his own reference also. It is highly recommended for this purpose. L. R. S.

CLINICAL BIOCHEMISTRY by Abraham Cantarow, M.D., Professor of Biochemistry, Jefferson Medical College; Formerly Associate Professor of Medicine, Jefferson Medical College and Assistant Physician, The Jefferson Hospital, Philadelphia, and Max Trumper, Ph.D., Commander, H(S), USNR; Lecturer in Clinical Biochemistry and Basic Science Coordinator, Naval Medical School, National Naval Medical Center, Bethesda, Maryland. Fourth Edition. W. B. Saunders Company. Philadelphia and London. 1949. Price $8.00.

The book correlates scientific facts with problems encountered daily in internal medicine. Experimental physiology and pathology has been remarkably fruitful in research of recent years, demonstrating significance of biochemical observation in abnormal states. Modern practice demands this knowledge in the application of aberrations of endocrine, renal and hepatic function, abnormalities of organic and inorganic metabolism, nutritional defects, edema, dehydration. The clinician is given a clear understanding of the significance and limitations of the results of laboratory investigations.

The first chapter, "Carbohydrate Metabolism," discusses digestive absorption. It is explained that disaccharides and polysaccharides are converted into the monosaccharides by the action of enzymes: ptyalin, amylase and invertase. The end products are glucose, levulose and galactose. The monosaccharides are absorbed from the intestine and carried to the liver in the portal circulation. Absorption occurs slowly, 1.8 gm. per kilogram of body weight following a carbo-

hydrate meal. Glucose is not absorbed in appreciable amounts from the stomach or colon. The rate of absorption of glucose from the small intestine is constant from hour to hour.

Carbohydrate metabolism in the liver is discussed by stating that upon reaching the liver, levulose is converted to glycogen to a somewhat greater extent than is glucose. Dextrose may be formed from proteins in digestion. This process (gluconeogenesis) is stimulated by hormones of the adrenal and pituitary glands. Glucose also may be formed from fat. Dextrose brought to or formed in the liver may undergo the following changes: (1) storage as glycogen (glycogenesis); (2) dextrose is utilized in the liver (glycolysis); (3) dextrose is passed into the systemic circulation and carried to the tissues where it is stored in the form of glycogen, (b) is utilized for energy (glycogenolysis and glycolysis) or (c) is transformed into fat.

The normal alimentary reaction or absorptive response, (sugar tolerance), is discussed by stating that, in normal subjects, increasing the quantity of ingested glucose from 25 to 200 gms. has no effect on the rate at which the blood sugar rises, but it may prolong the rate of hyperglycemia. The blood sugar rises sharply within the first hour, returns to normal fasting level at the end of one and one half to two hours (hypoglycemic phase), and a raise to the fasting level at about three to four hours. The state of carbohydrate nutrition has a definite influence on the alimentary glucose response of the normal individual. It is, therefore, important that the individual will have taken a normal diet for several days prior to the performance of the test. In the discussion of diabetes mellitus, it is stated that the fundamental fault is a deficiency in pancreatic secretion (insulin). Recent demonstrations of the influence of the hormones of the anterior pituitary and adrenal cortex upon carbohydrate metabolism has raised some doubt as to whether a quantitative deficiency in insulin secretion is invariably the only cause of diabetes mellitus. Hyperthyroidism results in a state of hypersensitiveness on the part of the liver for this conversion of glycogen into glucose.

Following, there are valuable discussions on protein, lipid, cholesterol, calcium, inorganic phosphorus, sodium, potassium, and chloride metabolism, and all other phases of the metabolic activities including vitamins and hormones. I consider this book valuable and to include knowledge that is essential to the clinician in the practice of medicine. P. M.

Principles and Practice of Surgery by Jacob K. Berman, A.B., M.D., F.A.C.S., Indianapolis, Indiana, Associate Professor of Surgery, Indiana University School of Medicine; Associate Professor of Oral Surgery, Indiana University School of Dentistry; Chief Consultant in Surgery, Billing's Veterans Administration Hospital, Fort Benjamin Harrison, Indiana; Director of Surgical Education and Surgical Research, Indianapolis General Hospital. With 429 illustrations. The C. V. Mosby Company, St. Louis. 1950. Price $15.00.

This new textbook of surgery illustrates a trend which has been developing for the last twenty-five years. It has been interesting to contrast this book with the older and popular Da Costa which I studied in school in the late 1920's. In those days, surgery was a matter of description of lesions, tumors and syndromes, with consideration, then, of operations designed to cure. This new book is concerned largely with the underlying physiology which leads to the development of pathologic lesions and their resolution. There is a great deal of consideration for the patient, his water balance, electrolyte balance and endocrine balance. There is little emphasis on the technical procedure itself which can, of course, be left to other more specialized texts.

Certainly, this is the proper and rational approach to good surgery and good surgical judgment. The book is highly recommended as a new departure in an ancient art. B. S. P.

Medical Management of Gastrointestinal Disorders by Garnett Cheney, M.D., Clinical Professor of Medicine, Stanford University Medical School. The Year Book Publishers, Inc., Chicago. 1950. Price $6.75.

This new book on gastrointestinal disorders is good, fairly concise, highly readable, and it covers the subject.

Part I, "THE PATIENT APPROACH," is a section devoted to history taking and to the examination of the patient. While presumably all practicing physicians know how to examine a patient, the reviewer has picked up several pointers.

Part II, "SYMPTOMS, DIAGNOSIS AND TREATMENT," is an elaboration of the various symptoms of gastrointestinal complaints, their causation and treatment. The author does not neglect the psychologic background of many gastrointestinal complaints. His report on the use of Viodenum and Azophyrin in the treatment of ulcerative colitis is interesting and new.

The book is well worth the perusal of all those who treat the patient with gastrointestinal disease. B.S.P.

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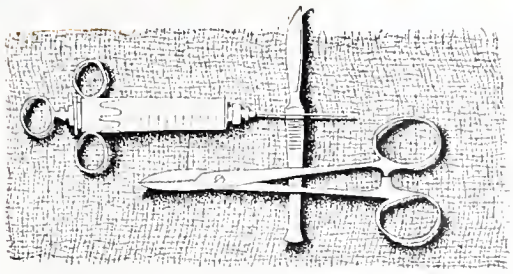
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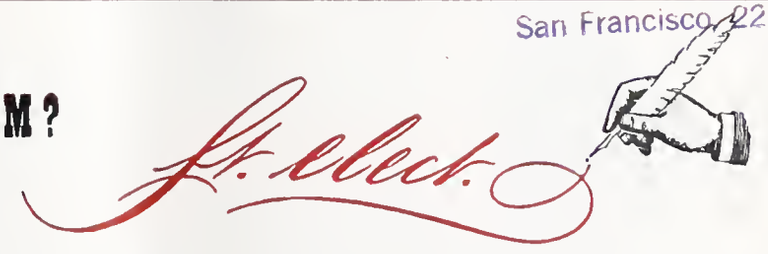
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Meat . . . in the Low-Sodium Diet

Clinical experience[1,2] and investigative data[3] indicate that the liberal use of meat may not be contraindicated when sodium intake must be restricted. Because unsalted meat contains only relatively small amounts of sodium, while contributing importantly to other nutrient needs, meat deserves special consideration in very-low-sodium diets, in sodium-poor diets, and in no-extra-sodium diets.

Table I lists the amounts of sodium[3] in three kinds of meat. Table II gives the estimated amounts of sodium in hospital diets planned for cardiorenal vascular patients.[4]

SODIUM IN MEAT[3]

	Sodium Provided by 60 Gm. Serving	Sodium Provided by 100 Gm.
Beef, without bone	32 mg.	53 mg.
Lamb, without fat	66 mg.	110 mg.
Pork, without fat	35 mg.	58 mg.

Table I

SODIUM IN HOSPITAL DIETS[4]

Sodium-Poor Diets*				Very-Low-Sodium Diet†
40 Gm. Protein	70 Gm. Protein	100 Gm. Protein	130 Gm. Protein	70 Gm. Protein
400 mg. Na	500 mg. Na	800 mg. Na	1,000 mg. Na	200 mg. Na

Table II

*Foods prepared and served without salt.
†Weighed diet. May contain 4 oz. of unsalted meat.
(Normal diets contain approximately 4 Gm. of sodium daily.)

Hence, the data here shown indicate that relatively generous amounts of meat may be included in low-sodium diets.

Meat serves well in the therapeutic objective of maintaining a high state of nutrition in patients with congestive heart failure or nephritic edema by providing valuable amounts of biologically complete protein and of B complex vitamins, including the recently discovered B_{12}.

1. Wheeler, E. O.; Bridges, W. C., and White, P. D.: Diet Low in Salt (Sodium) in Congestive Heart Failure, J.A.M.A. *133*:16 (Jan. 4) 1947.
2. Wohl, M. G., and Schneeberg, N. G.: Dietotherapy (Cardiovascular Disease), in Jolliffe, N.: Tisdall, F. F., and Cannon, P. R.: Clinical Nutrition, New York, Paul B. Hoeber, Inc., 1950, chap. 27.
3. Bills, C. E.; McDonald, T. C.; Niedermeier, W., and Schwartz, M. C.: Survey of the Sodium and Potassium Content of Foods and Waters by the Flame Photometer, Fed. Proc. *6*:402 (Mar.) 1947.
4. Mayo Clinic Diet Manual, Philadelphia, W. B. Saunders Company, 1949, p. 113.

The Seal of Acceptance denotes that the nutritional statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.

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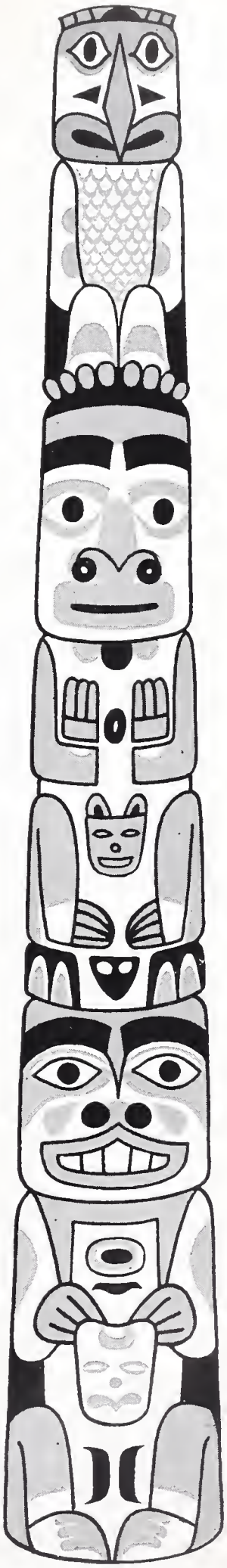
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3. Kelley, S. F.: Choice of Sympathamimetic Amines. Carnell Conferences on Therapy, II, 1947, p. 156.

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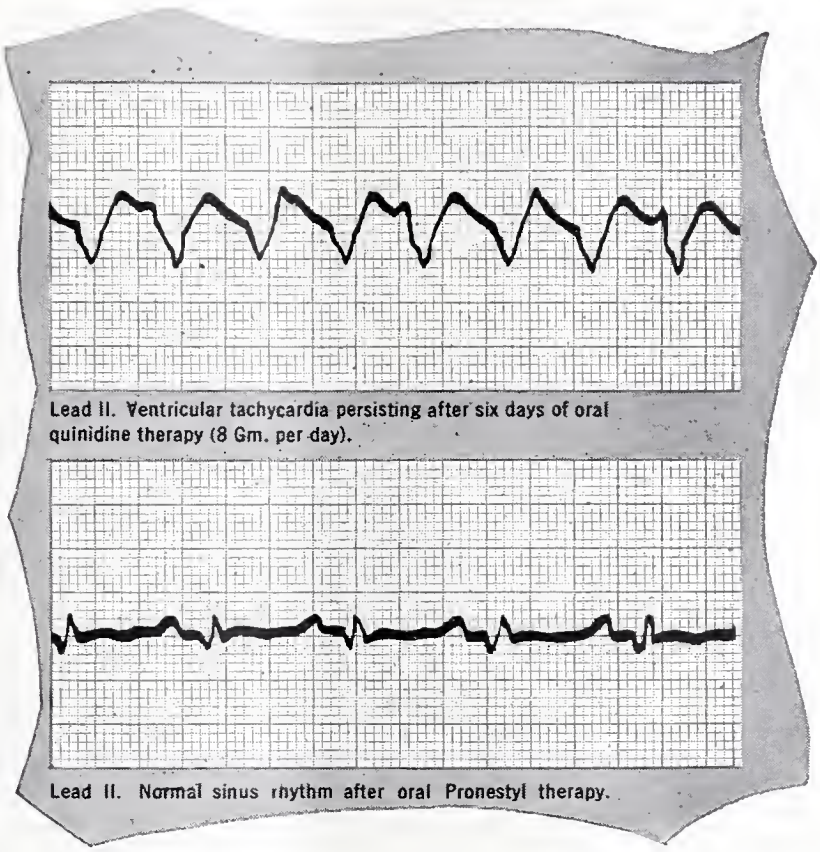
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1. Bortz, E. L.: Management of Elderly Patients, Postgraduate Med. 3:186 (Mar.) 1950.

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Scientific Articles

FRACTURES ABOUT THE ANKLE

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FRACTURES OF the ankle may be classed as important surgical conditions because: (1) they are of frequent occurrence, both in ordinary civil life and in industry; (2) they involve an important weight-bearing joint and frequently result in a high grade of disability.

In considering the mechanism of production of fractures of the ankle, one must consider certain anatomic features in the architecture of the ankle joint as they have an important bearing on the behavior of the bones and ligaments when injured. The ankle mortise is formed by the lower ends of

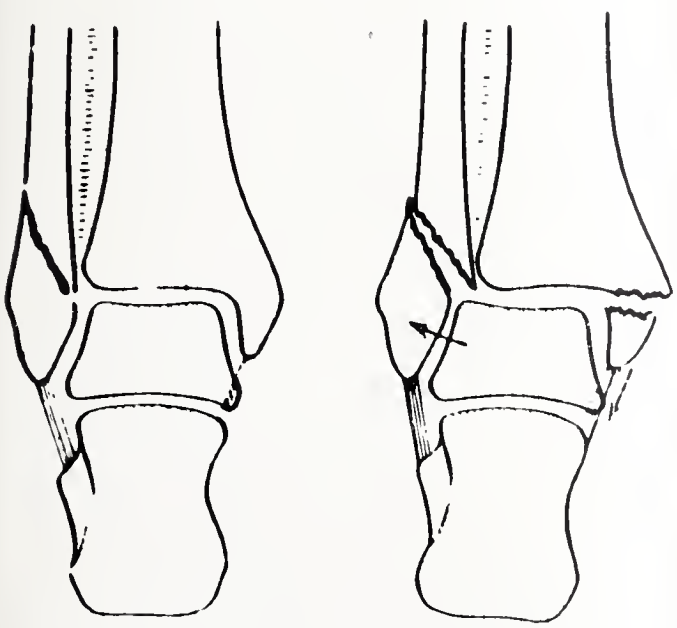


Fig. 1. External rotation fracture of the ankle.

the tibia and fibula, which are strongly bound together by ligaments. The astragalus is held firmly in the ankle mortise by the internal and external lateral ligaments which pass from the tibia and fibula to the tarsus, and are strong and tough, permitting little lateral motion. From the external lateral ligament, a strong band passes to the posterior surface of the astragalus, binding the astragalus strongly to the fibula. There is no counterpart of this band on the medial or inner side of the joint; consequently, in all injuries in which the tibio-

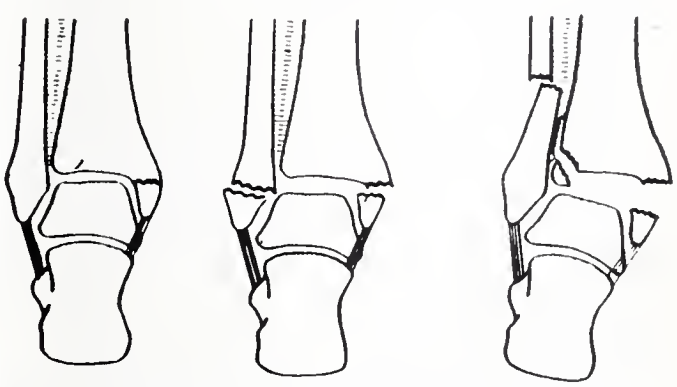


Fig. 2. Abduction fracture of the ankle.

fibular continuity is lost, the astragalus remains attached to the fibula and is displaced with it. This fact is the key to the problem of ankle fractures.

Fractures and fracture dislocations of the ankle joint generally are caused by indirect violence. The forms of indirect violence which produce fractures about the ankle are: (1) external rotation, (2) abduction or eversion, (3) adduction or inversion, and (4) upward compression thrust against the lower tibial weight-bearing surface.

(1) *External rotation.*—(Fig. 1.) In this type of violence, the foot is rotated outward around the vertical axis of the leg and the force is transmitted to the fibula as a torsion strain which breaks the fibula in a spiral or oblique direction. The tibiofibular ligaments usually remain intact and there is little diastasis of these bones. If the violence continues, the next injury produced is a rupture of the internal lateral ligament or a tearing off of the internal malleolus.

(2) *Abduction (Eversion).*—(Fig. 2.) When an abduction force is applied at the ankle, the astragalus tends to rotate outward in the mortise and exerts a bending strain against the fibula and a strong ten-

From the Dickson-Diveley Clinic, Kansas City, Missouri.
Presented before the American College of Surgeons, Sectional Meeting, St. Louis, Missouri, January 22, 23, 1951.

sion on the internal lateral ligament. It is probable that the most frequent sequence of events is rupture of the internal ligament, tearing off the internal malleolus and then fracture of the fibula. Diastasis of the tibio-fibular joint does not occur when the fracture of the fibula is low down; when high up, it is usual.

(3) *Adduction (Inversion).*—(Fig. 3.) With this

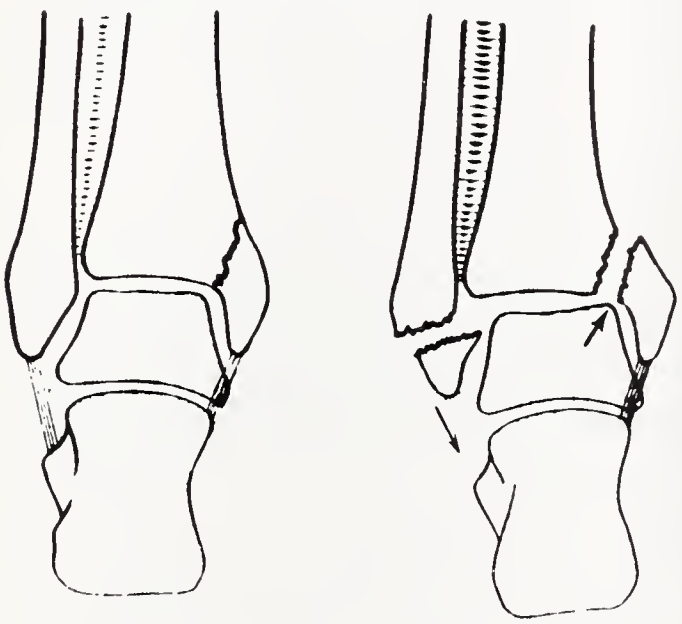


Fig. 3. Adduction fracture of the ankle.

form of violence, the astragalus rotates inward in the ankle mortise. The primary lesion is a tearing off of the external malleolus, a fibular fracture. The continued violent thrust of the rotated astragalus against the internal malleolus causes it to fracture secondarily.

(4) *Upward Compressive Thrust on the Lower Tibial Articular Surface.*—(Fig. 4.) Such fractures most commonly occur when an individual falls from a height and lands on his feet with sufficient force to exert a strong upward impact against the lower tibial weight-bearing surface. Such force results in the separation of a triangular fragment from the posterior surface of the tibia. Such a fracture is called a posterior marginal fracture. The fragment displaces with the astragalus and fibula. This fracture may occur alone, but is usually associated with fracture of the internal and external malleoli. There is some lateral displacement of the ankle in this fracture but the chief displacement is a backward one of the astragalus. Occasionally, the same type of fracture involving the anterior margin of the lower articular surface of the tibia occurs, which is known as an anterior marginal fracture. The term "trimalleolar fracture" has been suggested by M. H. Henderson to describe fractures of the malleoli complicated with an anterior or posterior marginal fracture.

In our series of 450 cases of fractures about the ankle, the incidence of these four forms of violence occurred as follows and corresponds with the figures of other observers.

External rotation, 57 per cent.
Abduction, 17 per cent.
Adduction, 10 per cent.
Posterior marginal, 16 per cent.

For a classification of ankle fractures which fulfills the requirements of simplicity and descriptiveness, the grouping as suggested by Platt seems the best. It is as follows:

A. Fractures of the malleoli:
1. Isolated:
a. Fibula—external malleolus.
b. Tibia—internal malleolus.
2. Combined:
a. Low bimalleolar without displacement of the astragalus.
b. Bimalleolar with displacement of the astragalus (Pott's-Dupuytren's fractures).

B. Fractures of the weight-bearing surface of the tibia:
1. Isolated:
a. Posterior marginal fracture.
b. Anterior marginal fracture.
2. Combined:
Anterior or posterior marginal fracture associated with fractures of the malleoli.

Such a classification is simple enough for the purpose of keeping records and, at the same time, is sufficiently descriptive of the condition found.

Since the time allotted does not permit the discussion of symptoms and diagnosis of ankle frac-

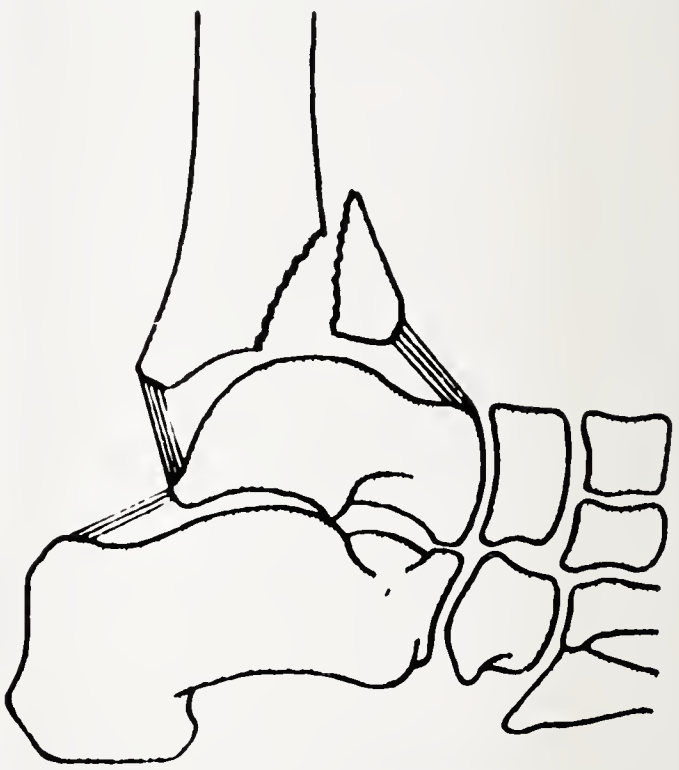


Fig. 4. Fracture from upward compressive thrust on lower tibial articular surface.

tures, nor should it be necessary before a group of this character, it should suffice to describe the classical displacement and point out a few of the pitfalls which are encountered in the diagnosis and satisfactory management.

The classical deformity as originally described by Percival Pott shows the foot in plantar flexion, and there is eversion or outward displacement of the foot. The latter may be slight or marked, depending on the degree of displacement of the astragalus. The internal malleolus is prominent.

Accuracy in diagnosis of fracture of the ankle is of paramount importance—as it is in all fractures involving a joint—because of the grave disability which results when such fractures are undiagnosed and receive inadequate treatment or no treatment at all. Especially, it is necessary to exercise care in examining and diagnosing the condition of the ankle when the lesser degrees of displacement are encountered. It is this type of ankle fracture which is most likely to be overlooked to the detriment of the patient and the reputation of the medical attendant.

A special word of warning should be said in regard to posterior marginal fractures. Apparently in a surprising number of cases, while the bimalleolar fracture is recognized and the lateral deformity corrected, the posterior marginal fracture is overlooked, or the importance of completely reducing the posterior displacement of the foot and accurately restoring the contour of the lower articular surface of the tibia is not appreciated. If this is not done, after the fracture heals, the limitation of ankle flexion and extension persists and a painful ankle results which definitely interferes with function and permanent disability is established.

TREATMENT

My routine in fractures about the ankle is to reduce them at the earliest possible moment and immobilize in a plaster cast.

Reduction of a fracture should never be undertaken until an accurate history of the injury has been secured and a careful physical and roentgen examination made. When the mechanism of the injury, the nature of the fracturing force and resultant deformity has been appraised carefully, reduction of the fracture should be carried out in a reverse order to that of the fracturing forces.

Reduction should be made under full anesthesia, inhalation or intravenous. The knee should be flexed to a right angle to relax the heel tendon. The ankle is grasped with one hand, pressure being made on the internal malleolus. The foot is grasped with the other hand well back toward the heel, the palm resting just below the external malleolus and the fingers grasping the inner side of the heel (Fig. 5). With the hands in this position, the foot is inverted and pushed sharply inward. Particular care must be taken to see that the heel is inverted and displaced medially, and not merely the movable anterior part of the foot, since it is through the posterior part of the foot that the fragments are controlled. Only a moderate degree of inversion is necessary, but I have never seen any harm come from too much inversion. In the occasional case of adduction type of displacement, reduction is carried out in the opposite manner from that just described and the foot is immobilized in a neutral position, avoiding over-correction into a valgus position, which carries the danger of permanent pronation of the foot. The essential feature of the reduction is a restoration of the ankle mortise. Failure to achieve this results in a faulty weight-bearing alignment of the ankle joint and a painful and impaired extremity will be the outcome, which can be improved only by later operative interference.



Fig. 5. Position of foot and hands for reducing fracture of the ankle.

After reduction, check x-rays should be taken in at least two planes and, if the reduction is satisfactory, a plaster cast is applied over stockinette or directly to the skin, the plaster extending from the toes to the knee with the foot inverted, the ankle at a right angle (fig. 6). The cast is immediately bivalved or split, which allows for swelling. Early weight bearing is highly satisfactory in fractures of the ankle joint provided firm immobilization of the fragments can be maintained. At the end of two weeks, a heel piece or walking iron may be incorporated in the cast and weight bearing insisted upon.

Anterior and posterior marginal fractures present certain complicating features which are deserving of special mention. In posterior marginal

fractures, exact reduction is most important and often is difficult to hold. Under general anesthesia, the knee is flexed to relax the heel tendon and the posterior part of the foot is adducted strongly and inverted with the ankle in moderate equinus to bring the foot into alignment with the leg. Since the astragalus and the marginal fragment are attached to the fibula and in fracture of the ankle displace with it, it seems logical that the primary step in reduction should be the correction of the fibular displacement. When sufficient adduction and inversion have been secured to correct the lateral displacement, the foot should be pulled forward to correct the posterior displacement and brought into complete dorsiflexion. Dorsiflexion should tense the posterior ligament, which is seldom torn, and so tend to press the displaced tibial fragment back into place and hold it there. A plaster cast is applied extending from the toes to the upper one third of the thigh with the foot inverted, the ankle at a right angle, and the knee flexed. Flexion of the knee will relieve the tension on the heel tendon with its tendency to cause a recurrence of the posterior displacement of the marginal fragment. After two to three weeks, the cast is cut down below the knee and the usual after treatment of fractures of the ankle followed. Weight bearing is not permitted under eight weeks. The instability of the ankle in posterior marginal fractures should be borne in mind constantly and a check-up roentgenogram made immediately following the application of the cast and at two day intervals for at least ten days to be sure that reduction is being maintained.



Fig. 6. Cast for immobilization of fracture of the ankle.

If, after a reduction of a posterior marginal fracture, instability of the ankle persists—as occasionally happens—and the posterior marginal fragment redislocates, open reduction must be resorted to, the posterior marginal fragment reduced and held with internal fixation.

In the treatment of anterior marginal fractures, accurate reposition of the tibial marginal fragment must be secured. Frequently, this can be accomplished only by open reduction and internal fixation of the fragment.

The after treatment or period of rehabilitation is most important in ankle fractures. At the end of from six to eight weeks, depending on the severity of the fracture, the cast is bivalved and physical therapy in the form of massage, passive and active exercises with whirlpool is given. In ten days or two weeks, if the x-ray examination shows an adequate union of the fragments, the cast may be discarded and the foot fitted in a strong supporting shoe. Any existing foot imbalance must be corrected by supports and shoe alterations or both.

Nonunion of a fracture of the internal malleolus is not uncommon, as the torn internal lateral ligament tends to fall into the fracture line and prevent contact between the fractured surfaces. This complication should be kept in mind and persistent discomfort over the internal side of the ankle should suggest careful rechecking of the fracture of the internal malleolus, manually and by x-ray. Delayed or nonunion can be corrected only by internal fixation. I prefer to use a pencil bone graft for this purpose rather than nails or screws as it is far less likely to cause discomfort and complications later.

Evidence is accumulating that fixation of bilateral malleolar fractures of the ankle, after reduction, by passing a Steinman pin across the fibular fracture provides more accurate and firmer immobilization than relying on plaster alone and achieves a more rapid and better result. This procedure carries with it the dangers inherent in the use of internal fixation in the treatment of fractures and should not be undertaken by those inexperienced in the technic of the operation.

Old fractures of the ankle with deformity and persistent disability require treatment for the relief of pain and to restore function so far as pos-

sible. Improvement in both respects can as a rule be secured by proper operative measures. Many surgeons with extensive experience have come to feel that arthrodesis of the ankle, a procedure which gives a good weight bearing, pain free extremity is usually the procedure of choice.

CONCLUSION

Fractures of the ankle constitute a serious injury in that interference with the function of an important weight bearing joint so often results. Accurate diagnosis, exact reduction, efficient fixation and careful after treatment are necessary if the patient is to receive the best result he is entitled to. It is of little importance that gifted or fortunately placed surgeons can point with just pride to a large percentage of successful results in ankle fractures. It is of importance, however, that the standard of treatment generally be of such excellence as to insure a high percentage of good results with strong, satisfactory weight bearing extremities. A century ago, the dictum of Dupuytren, "Under the most favorable condition they (fractures of the ankle) almost always leave deformity and lameness, which renders progress difficult or painful," may have had some justifications. Today with the x-ray and modern facilities for treatment, such results should be the exception and not the rule.

4312 Nichols Parkway.

PREVENTION OF SUICIDE

JACK R. EIDELMAN, M.D.
ST. LOUIS

ALMOST EVERY practitioner is faced at one time or another with the problem of suicide. Suicide is the leading cause of death in psychiatry except in the oldest age group. The bare statistics are profoundly disturbing; in the United States alone, the number of deaths from suicide yearly has reached 22,000.[1] In 1947 the rate of suicide was 11.2 deaths per 100,000 population, as compared to 23 deaths per 100,000 population due to motor vehicle accidents, 16,538 suicides being recorded.[1,2] In that year suicide stood third in order of frequency in cause of death by violence in the United States.[2] When one adds the large number of attempted suicides to those which are successful, the significance of the problem is even more apparent. Statistics show no more than the minimal suicide rate. Many suicides are concealed by the family when possible and some suicides are attributed to accidental death.

It should be emphasized that suicidal impulses and thoughts are widespread in our civilization. Many individuals have at one time or another in their lives the impulse to commit suicide. This point is of importance in handling patients since at times it may be necessary for the physician to reassure a patient that the presence of a suicidal thought is not of itself an indication of psychoses or of impending phychoses. An important point is that in the absence of other signs of disturbance, isolated suicidal thoughts need not be taken seriously. In addition it should be pointed out that an individual who is sufficiently normal and mature for all practical purposes may in the course of his life have an extraordinary variety of illogical thoughts and impulses, occasional suicidal thoughts, various disturbing sexual ideas and obsessions, without any symptomatic disturbance of any kind.

From a practical standpoint, particularly its prevention, suicide may be conveniently discussed under the following headings: (1) who commits suicide, (2) motives for suicide, (3) recognition of the potential suicidal person, (4) management of the suicidal patient.

WHO COMMITS SUICIDE?

The majority of suicides occur in patients who are severely depressed. In addition to uncomplicated depressions, suicide may occur in almost any type of mental disorder. Review of various publications indicates considerable confusion as to just what is included in the term "depression." In general, there are three chief types of depression for the practitioner to consider:

1. Manic depressive depressions and involutional melancholia. Involutional melancholia is a rather loose group and under this term may be included various agitated depressions of middle aged and older patients.

2. Depressive reactions which occur in organic illness such as paresis, cerebral arteriosclerosis, brain tumor, and various circulatory disturbances.

3. Depressive reactions which occur on a psychologic basis but still do not belong to the group of manic depressives. For the sake of simplicity the depressions of this third group may be termed "reactive depressions."

Reactive depressions are those that arise in reaction to obvious external causes that might naturally produce sadness such as sickness, bereavement and business difficulties. The differential diagnosis of reactive depressions and manic depressive depressions is not always easy and if the depression is severe the differentiation is relatively unimportant since the therapy of the depression is the same; prognosis, however, is different.

In addition to the depressive reactions, suicide may occur in the following categories:

1. *Hysterical personality.*—This is the extremely unstable individual who attempts or commits suicide in spite or in revenge. Here there is drama; the individual attempts to control his environment by his suicidal attempt. These people are emotionally immature and unstable, with frequent outbursts.

2. *Delirium.*—Not infrequently delirious patients commit suicide while being treated in a general hospital. The delirium need not be alcoholic but may be secondary to any medical, surgical or toxic state. Delirium may occur at night in cases when it is not present during the day; individuals who

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are delirious should not be left alone for a moment. Nurses should be trained to report any evidence of delirious reaction. Manifestations to be watched for are disorientation, severe fears, undue anxiety, tremulousness, confusion, delusions, and hallucinations.

3. *Acute Alcoholism.*—The presence of acute alcoholism has often been noted in surveys of suicide. Release of inhibitions may arouse strong feelings of guilt, fear, or aggression; the suicidal attempt is the reaction to such consciously unacceptable impulses.

4. *Schizophrenia.*—Depression is frequently associated with schizophrenic reactions and responds well to therapy. Schizophrenic patients may commit suicide in response to auditory hallucinations.

5. *Paranoid Reactions.*—These patients may attempt suicide to escape persecution, and also in response to auditory hallucinations.

6. *Panic Reactions.*—Not infrequently patients are noted to have overwhelming fears and anxiety associated with conflicts concerning homosexuality, other sexual problems, fear of loneliness or deep seated aggressive impulses. The overwhelming fear is the central reaction. The physician need not concern himself with the cause of the panic but should be able to recognize them when they occur and refer such patients to a psychiatrist.

MOTIVES FOR SUICIDE

The background of many suicidal patients has been noted to reveal emotional immaturity, shyness, infantile attitudes, sensitivity, few recreational outlets, emotional instability and in general poor personality integration. Not infrequently suicides are scattered through a family history, indicating a constitutional predisposition to depressive tendencies and suicidal reactions.

The motives for suicides are not always easy to determine. Such seemingly helpful leads as suicide notes and information from relatives are of little value. The real reasons are often concealed rather than revealed. Many patients and relatives are often not aware of motivation which is below the conscious level. Various statistical studies[3, 4] indicate factors such as sickness, disability, death of relatives or friends, financial worries, pregnancy and frustrated love affairs to be prominent motives for suicide. While these factors may be of importance, generally speaking personality reactions of a more serious nature are responsible for the attempt at self destruction. In general, there is a wish to escape the mental suffering of fear, sense of failure, difficult family situations and various disappointments. Hopelessness, despair, frustration and a deep sense of loneliness have often been noted to exist.[5, 6]

Suicide has been defined by Karl Menninger[7] as "an attempted escape from an intolerable life situation." One might attempt then to evaluate motives for suicide in terms of those situations which make life intolerable for the patient. Psychiatric studies of many suicidal individuals reveal the presence of severe guilt feelings, hostility and aggression. These are closely intermingled and related. Guilt feelings may give rise to depressions, not from what one has done but from what one has unconsciously wished to do. A severe depression may follow, for example, the death of a parent whose continued existence had prevented the fulfillment of a greatly desired wish, such as marriage. In such case the depression results from feelings of guilt which follow gratification of a hostile desire which is consciously repudiated. Jamieson[8] noted "no one kills himself unless he first wished to kill another or at least wished the death of someone." This is a significant observation, which is borne out frequently in clinical histories. It is the opinion of many modern psychiatrists[9] that depressions represent a penance for repressed hatred, aggressiveness and other repudiated tendencies and impulses that have given rise to guilt feelings.

REPORT OF CASES

A. C. This 35 year old white female became depressed and attempted suicide soon after the death of her husband. She evidenced constant self accusatory ideas, repeating over and over that she was responsible for his death. Actually her husband had died as a result of a ruptured aorta and had refused medical care throughout his entire illness. The psychopathology underlying this suicidal attempt is the familiar mixture of guilt and hostility. The patient had been extremely unhappy and had stayed with her husband only because of her child, recalling vividly that her own mother had deserted the family and had run off with another man. For several reasons she found life with her husband intolerable; there was a constant conflict between a desire for divorce and her sense of duty; her feelings for her husband were essentially those of resentment and aggression, and were submerged and repressed. His death released the entire constellation of submerged feelings, giving rise to tremendous guilt reaction and severe depression.

R. M. This 29 year old white female unsuccessfully attempted suicide, after fatally shooting her three year old son and unsuccessfully attempting to shoot her daughter. Her physician, friends and family were extremely surprised at this reaction, having considered her a well adjusted person. The history revealed the patient to have always been extremely self-conscious, with marked inferiority feelings and as a lonely person who was unable to identify with either parent. During her earlier years she was envious of a brother who was always in the limelight, and toward whom she felt inferior. As a child and during her school years she was overweight, avoided others and had few friends. She married a man who had not been able to support her well, and with whom she had lived in a rather disreputable shack for about eight years. During this entire period of time the patient looked forward constantly to having living conditions which were more like those of her friends. As time went on better conditions failed to materialize and the future looked blacker and blacker. She was unable to take care of her house, having tremendous resentment toward having to live in such conditions, toward her husband because of his inability to keep a job and because of his lack of understanding. These feelings were repressed and were not recognizable to her husband or to other members

of the family. As the patient continued to harbor these aggressive and frustrated feelings, life became more and more unbearable and she felt suicide the only way out. She felt her husband was incompetent to take care of the children and that the only way was to take them with her. Since her recovery from this depression of seven years duration she has been able to handle her submerged resentment on a conscious level and has satisfactorily adjusted her life.

These histories illustrate the fact that depressions are frequently psychologically unhealthy methods of dealing with aggressive and frustrated impulses.

Homicide is not infrequently associated with suicide, this relationship being often ignored in present day thinking; hostility and aggression is a common denominator. Various studies have confirmed this fact.[2]

It is noted that in the previous discussion of suicide little mention is made of serious physical disease or of chronic illness. If such conditions were important as a cause of suicide it would be an extremely important point to the physician who sees so much serious and chronic illness. Clinical experience, however, shows that serious pain and physical illness does not increase the suicidal risk or in fact create much of a suicidal problem. The risk of suicide is not a serious one in chronic diseases. It is true that any frustrating experience may act as a trigger mechanism to set off a variety of psychiatric reactions, including suicidal attempts, but the actual physical disease or pain is an incidental factor in the production of the reaction. As a matter of fact, it is probable that physical disease and pain may lessen the suicidal risk. As mentioned, a suicidal attempt often represents an extreme form of self punishment and self destruction as a method of alleviation of conscience pangs about guilt impulses. If disease and pain produce suffering there may be less need for self inflicted punishment.

RECOGNITION OF THE POTENTIAL SUICIDE

Since the majority of suicides occur in depressive states, the first point in the prevention of suicide lies in the proper diagnosis of depression and in the recognition and evaluation of the danger signals of suicide.

Many of the suicides of which one reads or hears occur in unrecognized depressions; depressions are never to be taken lightly. There are many cases of "minor depressions" which are never recognized as such and receive no understanding treatment. Mild or subacute depressive episodes may be passed off as ordinary fatigue, laziness or worry. The patient frequently complains only of physical symptoms and often does not spontaneously complain of feeling despondent or melancholy. Even on direct questioning when he does admit despondence, he attributes his mood to body ailments. It is almost natural for the patient to turn to his body for an expression of discomfort. There is a prejudice among the laiety against anything that might be thought of as "mental disease." Only the severely depressed patient shows objective despondency or retardation.

Almost any physical complaint may be found in a depressive state. Among such common symptoms are headache, tightness in the head, fatigue, loss of appetite, loss of weight, constipation and various vasomotor symptoms.

The alert physician will look for the secondary symptoms suggesting emotional and depressive disturbances. Among common symptoms of depressions are: (1) mental depression; a feeling of pessimism and dejection not justified in the patient's circumstance, (2) loss of interest in things or persons which previously were of great interest, (3) feeling of inadequacy, (4) difficulty in thinking, (5) difficulty in making decisions, (6) loss of initiative, (7) loss of self-confidence, (8) unwillingness to meet people, (9) a general slowing, including actions, walking, and talking, (10) a feeling of hopelessness, (11) weeping spells with inadequate and without apparent cause, (12) agitation, (13) ideas of guilt, self depreciation and self accusation, (14) severe hypochondriasis, (15) severe insomnia.

Once the physician recognizes the presence of depression, the next step is evaluating its depth. Here the art of medicine rather than the science is involved since it becomes a matter of judgment. Among useful "danger signals of suicide"[10] are:

1. *A Deep Mood of Depression.*—This cannot be described simply or in numerical terms. The duration of the episode, ability to work and the presence and degree of the listed depressive symptoms must be considered.

2. *Vegetative Signs of Deep Depressions.*—The most reliable indicators of the depth of depression and of the associated severe suicidal risks are to be found in the biologic manifestations of deep depressions. These are: (a) persistent loss of appetite, (b) severe loss of weight, (c) persistent insomnia, (d) persistent constipation, (e) cessation or diminution of menstruation, (f) loss of sexual desire or potency.

3. *Depression Delusions.*—Many individuals who are depressed feel unworthy, inferior and guilty, and in some cases their ideas reach a point of actual delusional formation. If such depressive delusions are persistent the likelihood of suicide is much more probable.

4. *Past History of Other Suicidal Attempts.*

5. *The Absence of Feelings of Affection.*—In a deep depression there is often so much conflict, guilt feelings and unconscious hostility that feelings of affection are felt or expressed only with great difficulty. The danger of such a situation is increased when the physician feels a coldness and a withdrawn self centered attitude with loss of friendly feeling on the part of the patient. In such cases there seems to be a deep chasm between the patient and his previously loved ones, or between the patient and the doctor.

6. *Increased Tension.* — Unexplained increased

pulse rate, blood pressure, tense facial expressions and feelings of unreality may be indicative of impending suicide. Frequently feelings of unreality are combined with depressions, constituting a danger situation.

In interviewing the depressed patient, the simplest way to discover suicidal intent is to ask the patient tactfully. Casually asking, "Well now, everybody who feels this way has a few suicidal thoughts, have you had any?" may reveal definite and specific suicidal ideas. If the patient answers affirmatively the questions may be further pursued as to method and reasons. The patient who is afraid he is going to commit suicide is often not so much a problem as the person who longs for suicide and looks upon death as a release. It is usually a release from his own conscience and from his own hostility. The depth of a patient's hostility toward someone is an important assay to make in determining whether or not there is real likelihood of suicide. This is also true for severe guilt feelings. The physician can contribute much to the prevention of suicide if these depressive symptoms and danger signals are kept in mind. The prevalent willingness to attribute physical symptoms, behavior, mood and personality disturbance to lack of vitamins or poor nutrition is to be deplored. In addition the physician must not be led astray by minor physical defects or even major physical defects which may be present but not contributing to the depression. The patient's emotional reactions and feelings are as much a part of him as are his blood, urine or metabolism and should receive no less consideration in the diagnosis of the disability or disease. The emotional state of every patient must be assessed carefully including those who present physical basis for their symptoms.

MANAGEMENT OF THE SUICIDAL PATIENT

Since suicide is in the majority of cases a symptom of depression, management of the suicidal patient resolves itself into the proper handling of depressions. One should determine first whether the depression is primary or whether it masks underlying illness such as organic brain disease, schizopherenia or various somatic diseases. If underlying disease is present, it must of course be treated properly. The physician must not be led astray by the presence of organic disease which is coincidental such as enlarged thyroid, nonfunctioning gallbladder, fibroid tumors and other pathologic conditions. Frequently patients are subjected to surgical and other procedures in the hope that their nervous and depressive symptoms will be corrected, but with disappointing results to both patient and physician.

The first point in treatment of a depressed suicidal patient is preservation of life. If the depression is severe, hospitalization is necessary. It is obvious, however, that not all patients can be hospitalized. One must at times take chances in order to help the patient and the family but all factors must be evaluated carefully and the family must share the responsibility.

Treatment may be started along several lines; drug therapy, occupational therapy, psychotherapy, electric shock therapy and hospitalization. As with any illness attention must be paid to general hygiene, diet, bowel function and other physical symptoms which the patient finds disturbing. A high caloric diet usually is indicated. Constipation should be prevented, especially in older patients.

Drug Therapy.—Symptomatic treatment is frequently effective and often affords relief. Opium, either the powdered extract or the tincture, is a valuable drug in depression, particularly in the older age groups. One-fourth to a full grain of powdered extract of opium or 5 to 30 drops of tincture from one to six times daily may afford marked relief of symptoms. Addiction need not be feared. Special effort must be made to insure satisfactory sleep. Barbiturates are extremely helpful; one must guard against underdosage since sleeping medicine to be worthwhile must be adequate. The depressive and otherwise emotionally disturbed patient usually can tolerate much more of the drug than the average patient. The wear and tear of sleepless nights and the struggle with suicidal impulses are far greater hazards than the administration of barbiturates. Sodium amytal, grains 3, or a similar drug may be given at bedtime and repeated as frequently as necessary to insure a good night's rest. The drugs may be changed from time to time. Other sedatives such as chloral hydrate, grains 10 to 20, sodium bromide, grains 15, may be used, separately, or in combination with barbiturates.

Just as sedative drugs are valuable for sleep, so stimulating drugs may be helpful in the morning. Dexadrine or other drugs of the amphetamine group are of some value. If ordinary doses give no effect the amount may be increased. Many patients become jittery and uneasy as a result of these drugs, but they are worth trying. In my experience, however, these drugs have been of little benefit in moderate or severe depressions.

Occupational Therapy.—Occupational therapy is a valuable accessory form of treatment. Activities should be encouraged, even if only to a limited degree. If the patient is unable to work, then walking, golfing, riding or other outdoor activities should be urged. If available such occupational therapy as weaving, painting and other art and craft work are valuable. At times depressed patients are inclined to undertake too much and then become worse from their incapacity to live up to expectations. Strenuous activities, physical and mental and social contacts may be postponed to the time when the patient has improved. Occupied time is an important part of therapy.

Change of environment is usually not of benefit to a severely depressed patient. Sending such a patient to a resort usually is of no value since the patient takes his guilt feelings and various other

disturbed emotions with him and brings them back when he returns. In addition the patient is usually idle, seldom enjoys the changed surroundings and may miss the protection of his family.

Psychotherapy.—Psychotherapy is part and parcel of medical practice. It should be emphasized that the attitudes and actions of the physician are frequently more important than his words. How the doctor acts, how he listens and how he speaks are often more important than what he tells the patient. It is a great mistake to deal with depressed and suicidal patients as if to imply that their complaints are invented or imaginary. Such tactics give no relief to the patient and, in fact, intensify their suffering. The statement "there is nothing wrong with you" is incorrect as to therapy and diagnosis. The patient feels that either the physician does not understand or that he does not care. Superficial attempts to cheer the patient up are also to be avoided. The physician must by his acts and attitudes indicate to the patient that he cares for him, is interested in him and is eager to help him, listening to a complete and thorough history and performing a complete physical examination. Psychotherapy of depressive cases must permit the patient to free his mind of his problems and should provide some measure of reassurance. The depressed patient must tell someone of his misery and of his discomfort. He may get temporary ease and some release by confessing his guilt or ventilating his various stresses, strains and emotions. The patient should be encouraged to share his mood and all his feelings, as his various conflicts and situations are discussed. "Blowing off steam" is important since if the patient merely tells a story in a passive manner, the therapeutic benefit is minimal or absent.

Positive counsel must be given as to work and activities and the patient is encouraged to bring up his problems. The physician need not delve into early childhood situations nor deal with unconscious conflicts. The patient needs guidance in a practical way about immediate and concrete problems.

The physician must guard against interpretation. This is the most difficult part of any psychotherapy and requires the greatest amount of skill, tact and timing. The physician should make no interpretation until he is sure of his ground and until a sound relationship with the patient has been established.

Sexual activities should be prohibited in depressions of any severity. The patient frequently attempts to reassure himself that he is still potent or that he is still devoted to his partner. The diminished sexual drives may result in feelings of failure, increased inadequacy and in self accusatory reactions. Sexual activities should not be resumed until the patient has practically recovered.

In referring a patient to a psychiatrist, it is important to guard against the attitude of rejection since manner of referral frequently may determine success or failure of the patient and his readiness to accept treatment. Mental patients are particularly aware of disinterest and rejection and frequently will report to the psychiatrist with a spirit of resentment.

Electric Shock Therapy.—The patient who is severely depressed and suicidal is frequently not amenable to psychotherapy or to medicinal therapeutic measures. Electric shock therapy is undoubtedly the best method of treatment for these patients. Electric shock therapy is almost specific for depressive patients whether of manic depressive origin, involutional melancholia or reactive depressions. Frequently severe depressive moods are altered from dejection to cheerfulness, from insomnia to sound sleep, from anxiety to calmness, in a brief period. Ideas of hopelessness and self accusation are often lost within a period of from two to three weeks. Electric shock therapy should be administered promptly if the patient does not respond to medical and psychotherapeutic measures. Mallinson[11] states: "No greater disservice can be done to the depressive patient than to withhold him from consideration, at least, for electric shock treatment."

In many cases it is feasible to administer electric shock treatment on an outpatient basis. Again it must be emphasized that the family must share in this responsibility; suicide is always a possibility, usually until several treatments have been administered.

Hospitalization.—Hospitalization for the depressed patient of severe degree is essential. This is the chief form of protection against suicide and also takes the patient away from stimuli which may have aided in precipitating the depression.

Criteria for hospitalization are not absolute; the "danger signals of suicide" previously listed are of value in making the decision. When in doubt, the patient should be hospitalized, or consultation with a psychiatrist or another physician should be arranged.

SUMMARY

The prevention of suicide is an important phase of preventive medicine and is largely the responsibility of the medical profession.

The physician is better prepared for his task if he is familiar with: (1) the conditions in which suicide is likely to occur, (2) motivation in suicide, (3) the recognition of the potential suicide, (4) the management of the suicidal patient.

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DISSEMINATED LUPUS ERYTHEMATOSUS IN IDENTICAL TWIN SISTERS ASSOCIATED WITH DIABETES MELLITUS IN ONE CASE

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Recently, disseminated lupus erythematosus in two identical twin sisters, one of whom had diabetes mellitus, has been studied and treated. A review of the literature failed to reveal any mention of a familial incidence of disseminated lupus erythematosus and we were unable to find any report of disseminated lupus erythematosus in a person with diabetes mellitus. Consequently the study of these two cases is reported.

REPORT OF CASES

Case 1. J. W., an 18 year old white female was admitted to St. John's Hospital on February 2, 1947, and discharged on February 11, 1947. The patient gave a history of diabetes since May 1946, discovered when she had had a tonsillectomy performed for poor hearing. She had lost twenty pounds at that time but had regained her weight. A study in September 1946 had revealed no positive physical findings. The red count at that time was 4,000,000, hemoglobin 77 per cent, white blood count 7,300. The differential showed 66 neutrophils, 22 lymphocytes, 2 eosinophils, 2 basophils and 7 monocytes. The sedimentation rate was 24 mm. per hour by the Westergren method. A Kahn test was negative and a basal metabolic rate was minus 7. The urine at that time showed 4 per cent sugar and a fasting blood sugar of 227 mg. per cent. Her physician referred her for control of the diabetes because of continued glycosuria in spite of 40 units of regular insulin three times a day. She was a premedical student and had been carrying a heavy scholastic load.

Physical examination revealed a fairly well nourished young woman, 64 inches tall and weighing 125 pounds. Her blood pressure was 104/70. The heart was not enlarged and the tones were good. There were no rashes or lymphadenopathy. The abdomen was tense but no organs were palpable.

Laboratory study showed a four plus glycosuria. There was a trace of albumin and an occasional white blood cell in the urine. The red blood count was 4,120,000, hemoglobin 78 per cent or 12 gm. per cent. The white blood count was 6,250 with a differential of 8 stab cells, 55 neutrophils, 31 lymphocytes, 5 monocytes and 1 basophil. A nonfasting blood sugar was 342 mg. per cent. An x-ray of the chest was normal.

During her hospital stay the temperature remained normal except for one rise to 100.2 F. Twenty-four hour quantitative test showed 112 gms. of glucose lost in the urine the first day. This was gradually reduced by insulin and dietary regulation to 58 gms. lost on the final day. It was thought that there might be some systemic condition to account for the resistance to insulin but complete examination and laboratory studies were unrevealing. The patient was discharged on a diet of 85 gms. of protein, 125 gms. of carbohydrate and 100 gms. of fat. She was instructed to take 50 units of regular insulin and 25 units of protamine zinc insulin in the same syringe in the morning, 15 to 20 units of regular insulin before lunch depending on her urinalysis, and 10 units of regular insulin before supper.

Her second hospital admission was on August 30, 1947, when she was admitted to a hospital for treatment of a skin infection. There was a pustular eruption scattered over the entire body, especially marked on the face, arms and chest. The remainder of the physical examination was essentially negative. Her temperature was 100.4 F. on admission and it rapidly rose to 102.8 F. Treatment consisted of penicillin injections and boric acid packs. She was discharged on the fifth day with the skin rash considerably improved. Her temperature had been 98 to 99.4 F. for the last two days. On this admission she had four urinalyses, the first showing three plus sugar and the others negative for sugar. The urines all showed a slight trace to one plus albumin with occasional white blood cells in the microscopic examination. She was given 30 units of protamine zinc insulin daily. In addition she was given regular insulin in a dosage of 30 units before breakfast, 20 units before lunch and 20 units before supper.

Her final hospital admission occurred on December 27, 1947, when she was admitted to St. John's Hospital. The skin infection had healed leaving round pigmented punched-out areas. In September she had had two abscesses in the thighs from insulin injections. These had healed but later she had developed fever, chills, weakness and anorexia with a loss of about 20 pounds in weight. Her insulin dosage had been reduced gradually to only 25 units daily and she had had some reactions at this dosage. She had had to stop her school work; later she stopped even housework and was confined to the bed and a chair. Some lymph nodes in her neck had become enlarged and tender during the last few months. She had had some dyspnea on exertion, occasional headaches and her eyes hurt her. There had been some dry cough and some pains in the chest and abdomen. She complained bitterly of sensitiveness of the nasal mucosa.

Examination revealed a fairly well nourished young woman, weak, but in no acute distress. Her skin was pale and warm, pocketed with round punched-out scars. She had some edema of the face but no skin eruptions. The nasal mucosa was reddened and sensitive. Some petechial spots were noted on the roof of the mouth. There were some enlarged and moderately tender lymph nodes in the anterior and posterior cervical chains. The respiratory rate was rapid and the sides of her chest were sore from coughing. The heart rate was 140, the first sound at the apex was split, and there was a coarse systolic murmur at the pulmonic area. The blood pressure was 140/80. There was generalized abdominal tenderness especially at the liver and splenic areas. The spleen was felt two fingers below the costal margin. There were large, moderately tender inguinal lymph nodes present bilaterally.

A catheterized urine on admission was positive for albumin, contained many red blood cells and about

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10 white blood cells per high power field. A stained smear contained a few pus cells but no bacteria.

The blood counts on admission showed 2,240,000 red blood cells, 7.5 gms. of hemoglobin and 8,950 white blood cells with a differential of 8 stab cells, 45 neutrophils, 43 lymphocytes, 3 monocytes and 1 eosinophil. Repeated blood counts continued to show a relative leukopenia with a definite shift to the left on the differential but with no abnormal cells noted. Eosinophilia did not occur. The normochromic anemia persisted in spite of blood transfusions. A hematocrit reading was 20, the mean corpuscular volume was 85 cubic microns, the mean corpuscular hemoglobin 35 micromicrograms and the mean corpuscular hemoglobin concentration was 37 per cent. One platelet count was 75,000 but a second was 360,000. A prothrombin time was 86 per cent and the coagulation time was 2½ minutes.

The patient was seen by Dr. Edward Reinhard, hematologist, who reported a white blood count of 6,650 with 2 metamyelocytes, 8 stab cells, 60 neutrophils, 24 lymphocytes and 6 monocytes. The red blood count was 2,340,000 with 6.7 gms. of hemoglobin, hematocrit 20. The mean corpuscular volume was 91 cubic microns, mean corpuscular hemoglobin was 30 micromicrograms and the mean corpuscular hemoglobin concentration was 33 per cent. He reported a reticulocyte count of 2.9 and a platelet count of 203,580. His examination of a sternal aspiration specimen showed normally cellular marrow with a differential well within normal limits. There was a moderate increase in the immature nucleated red blood cells with some decrease in the normoblasts but this was not sufficiently marked to be abnormal.

Three blood cultures were negative, one cultured aerobically, one anaerobically and one on Sabouraud's medium. Routine blood agglutinations were negative except for typhoid H, positive 1:80. Agglutinations for heterophil antibody were negative.

The fasting blood sugar was 225 mg. per cent and the nonprotein nitrogen was 41 mg. per cent on admission. A carbon dioxide combining power was 37 volumes per cent. On admission the total serum protein was 5.5 per cent with 3.3 per cent albumin and 2.2 per cent globulin. On January 15 she was found to have a total protein of 10.9 per cent with 3.8 per cent euglobulin.

An x-ray of the chest was negative. Biopsy of a lymph node was attempted but only muscular tissue was obtained. The blood vessels in this specimen were not unusual and there was no definite evidence of pathologic condition.

Her temperature on admission was 98.8 F. but it rose to 104.8 F. on that night. She continued to run a remittent fever of from 102 to 104 F. except for about four days in the middle of her hospital stay when her temperature was normal. She was given penicillin and streptomycin by injection throughout her hospital stay. Bismuth subsalicylate was given by injection three times and Bistrimate tablets were given for the last two weeks of her life. For the last two days of her life she was given para-amino benzoic acid without effect upon the course. She was given 20 units of protamine zinc insulin and 10 units of regular insulin in separate syringes every morning. The quantitative urinalysis showed from 75 to 85 grams of glucose lost daily on this regime and a mild ketosis occurred at one time when she did not eat because of mucous membrane involvement. The patient was then put on a soft diet with feedings of about 50 grams of carbohydrate every four hours and 8 units of regular insulin with each feeding. On this regime her diabetes became well regulated and was not a problem during her last two weeks of life.

When first admitted she had some edema of the face but there was no skin eruption. On January 7 a large purpura was found over the flexor and extensor surfaces of both wrists and the dorsum of the hands. She also developed an acute joint swelling involving particularly both knees and the small joints of the hands. She was seen by Dr. Garold Stryker, dermatologist, who found an eruption on the face and the extremities with a predilection for the extensor surfaces and about the joints. The eruption consisted of variously sized and shaped macules which were sharply defined and edematous. The lesions were individual with some coalescence. There was no induration, ectasia of the vessels or patency of the follicles. He felt at that time the most likely diagnosis was erythema multiforme. However her dermatologic picture changed rapidly and on January 13 there was no evidence of erythema multiforme. Dr. Stryker reported then that the entire body skin was edematous and she was covered with macules in which there was a persistent ectasia, patent follicles and atrophy. He made the diagnosis of acute disseminated lupus erythematosus at that time, and all the internists and dermatologists who saw her concurred in this diagnosis after January 13. The eruption stayed essentially the same thereafter until her death. She developed a tenderness of the lips and mouth, the mucous membranes became red and edematous and bled easily. There was considerable dysphagia and diarrhea consequent to the mucosal lesions. She became rapidly worse with tenderness over the large joints and hands, rales in both bases, and marked naso-oro-pharyngeal oozing of blood. She expired quietly on January 21. Permission for autopsy examination was refused.

Case 2. J. W., 20 year old white female, was first studied at the office on March 9, 1949. She complained of rheumatism since January 1, 1949, when she went to work in a hospital as a nurses' aide. The wrist, fingers, hips and knees were involved with fleeting joint pains and stiffness. The pains were in all the joints of the fingers but the proximal interphalangeal joints were particularly involved. There had never been any swelling or erythema about the joints. She had had no dermatitis but she had noticed that her eyes were sensitive to light. Detailed questioning elicited the fact that two years previously she had had severe chest pains lasting for about one week.

Physical examination revealed a rather poorly nourished young woman with enlarged tonsils. Her blood pressure was 120/60, the heart tones were good and there were no murmurs. The spleen was not palpable and there was no lymphadenopathy. The skin was clear. The joints had a normal appearance. A red blood cell count was 4,070,000 with a hemoglobin of 66 per cent. The white blood cell count was 5,400 with a differential showing 3 eosinophils, 4 stab cells, 59 neutrophils, 31 lymphocytes and 3 monocytes. A Kahn test was negative. The urine showed a trace of albumin with sugar negative. The microscopic examination showed from 10 to 15 white blood cells per high power field and some clumps of white blood cells. The total serum proteins were 7.4 per cent, albumin 3.6 per cent and globulin 3.8 per cent with the euglobulin fraction 0.5 per cent. An electrocardiogram showed the heart to be in a vertical position with a ventricular rate of

74 and a PR interval of 0.14 seconds. A cephalin-cholesterol flocculation test was 3 plus in 24 hours. An x-ray of the chest was negative and a kidney, ureter and bladder examination showed a calcified mesenteric node to the right of the second lumbar vertebra. She was treated at that time with iron, vitamins and salicylates with temporary improvement.

She was admitted to St. John's Hospital on August 25, 1949, at which time she stated that she had become progressively worse in the last two months. She complained of chills and fever almost daily for two months. At one time her temperature had gone to 103 F. although usually it was from 99.5 to 101 F. The rheumatism had become severe with erythema and swelling of the hands so that she was unable to close her fist.

Physical examination revealed a temperature of 99.8 F. and slight tenderness in the left upper quadrant on inspiration. Her blood pressure was 125/65 and the heart was negative. There was no glandular enlargement or dermatitis. A red blood cell count was 3,100,000, the hemoglobin was 50 per cent and a white blood count was 5,400. A differential showed 1 eosinophil, 17 stabs, 46 neutrophils, 35 lymphocytes and 1 monocyte. A catheterized urine showed 4 plus albumin, negative sugar, 10 to 12 white blood cells and large clumps of white blood cells with from 4 to 8 red blood cells per high power field. A urine culture showed no growth.

Repeated blood counts during her hospital stay were essentially the same and the secondary anemia did not improve dramatically in spite of three blood transfusions. The urine continued to show moderate amounts of albumin with a few red blood cells and an occasional white blood cell. The cephalin-cholesterol flocculation was 4 plus in 24 hours. A thymol turbidity test showed 6.2 units. The total serum proteins were 8.4 per cent, the albumin was 3.3 per cent, and the globulin was 5.1 per cent. The euglobulin fraction was 1 per cent. Nonprotein nitrogen was 38 milligrams per cent, and the creatinine was 1.4 milligrams per cent. A bromsulfalein test showed no dye retained at 45 minutes. A blood culture was negative and smears for malarial parasites were negative. She was treated with streptomycin and penicillin by injection, folic acid, iron and vitamin B complex by mouth, in addition to three blood transfusions. After each blood transfusion her temperature would go to 104 or 105 F. despite the fact that Benadryl was given with the blood transfusion. She would continue to run a fever of 101 to 103 F. for from two to three days after each blood transfusion. On her third hospital day a faint rash was noted at the nose and the face which was butterfly shaped. The liver became palpable at the costal margin and a few enlarged cervical nodes were noted in the posterior cervical chain and at the jugulo-digastric region. On the fourth day she was started on intravenous aureomycin, 100 mgs. every six hours. This was given for three days and then she was started on 250 mgs. of aureomycin every three hours by mouth. This was continued until her discharge although no definite improvement on this regime was noted. A bone marrow aspiration was performed by Dr. Edward Reinhard, hematologist. A differential count of the bone marrow smear showed 5.5 neutrophils, 8 stab cells, 16.5 metamyelocytes, 35.5 "C" myelocytes, 1 "B" myelocyte, 0.5 "A" myelocytes, 3.5 eosinophils, 1.5 reticulum cells, 0.5 phagocytic clasmatocytes, 25.5 primitives and 2 plasma cells. There were 21 nucleated red blood cells per 100 white blood cells. The megakaryocytes were normal. In a Wright's stain of concentrated marrow there were numerous cells with prominent inclusion bodies and rosettes of leukocytes. These have been described by Hargraves and are said to be characteristic of disseminated lupus erythematosus. She was discharged from the hospital with her condition essentially unimproved.

From September 1949 until January 1950 she was admitted seven times to a hospital in another town for blood transfusions with Benadryl and penicillin injections. During this time her clinical condition gradually deteriorated. The rash became prominent across the bridge of the nose and on both cheeks and eventually spread to the entire body. She developed many palpable and tender lymph nodes in the neck and in the axillae. There was a rather marked loss of hair. She also complained of small ulcers in the mucous membranes of her mouth and a sore tongue. The secondary anemia persisted and became worse in spite of many blood transfusions. She eventually developed a grossly bloody hematuria. In November she was flown to the Mayo Clinic where she stayed for three weeks on the service of Dr. D. M. Masson.

The Mayo Clinic concurred in the diagnosis of acute disseminated lupus erythematosus. They were unable to treat her with Cortisone because of the limited supply available. They gave her three blood transfusions but the anemia only became worse and the red blood count fell to 1,000,000. She became quite weak and unable to eat because of anorexia. She was returned to her home for terminal care. On January 4 she was again admitted to a hospital with a marked pallor and with the joints swollen and tender. She complained of blurred vision and slight dyspnea even at bed rest. Her temperature varied from 100 to 106 F. Her red blood count was 2,020,000, hemoglobin 6.4 grams per cent. There was a 3 plus albuminuria and microscopically the urine showed from 6 to 9 white blood cells, an occasional red blood cell and a few granular casts.

On January 15 she suffered a marked tachycardia and tachypnea. She had a slight convulsive seizure, lapsed into coma and died.

AUTOPSY, MICROSCOPIC FINDINGS*

Sections of the liver show somewhat dilated sinusoids containing fairly large numbers of neutrophils and a few eosinophils. The Kupffer cells are prominent and contain a small amount of brown pigment.

Sections of the lung show a rather marked interstitial type of pneumonia. The alveolar walls are thickened and somewhat hyalinized and contain large numbers of neutrophils and eosinophils. The alveoli are lined with fibrin and much of this fibrin is somewhat necrotic and in areas shows organization. The blood vessels are somewhat thickened and the walls are somewhat hyalinized and there are wide collections of inflammatory cells about many of the blood vessels. The bronchial walls are somewhat thickened and hyalinized and about these walls are collections of inflammatory cells with a few giant cells.

Sections of the kidney show a few glomeruli containing large hyalinized loops. A few of the glomerular capsules are thickened and hyalinized. There is some interstitial infiltration of round cells and neutrophils.

Section of the lymph nodes shows a rather marked fibrosis with hyalinization of the fibrous tissue. The architecture is rather distorted and throughout the nodes are small tubercle-like structures of hyalinized

*Report of Dr. Hollis Allen, Pathologist.

fibrous tissue and, about these areas, are a few neutrophils. Section of the heart shows some increased fibrous tissue.

Diagnosis: Lupus erythematosus disseminatus. Death was apparently brought about by pneumonia.

DISCUSSION

Study of these two cases raises two questions: the role of familial factors in the etiology of disseminated lupus erythematosus, and the relationship of this disease to the endocrine system.

It is difficult to find any mention of a familial incidence of lupus erythematosus in the literature. Zeisler and Bluefarb[1] reported cases of lupus erythematosus in a brother and sister. The brother had subacute lupus erythematosus and recovered, while the sister had chronic discoid lupus erythematosus and was never seriously ill. Zeisler and Bluefarb consider a familial incidence to be rare in subacute and chronic lupus erythematosus. In 1901 Rona[2] reported cases of chronic lupus erythematosus in a brother and sister. Sequeira[3] in 1903 had four cases of chronic lupus erythematosus in two pairs of sisters.

In spite of these occasional cases, lupus erythematosus is not considered to have a familial incidence. The usual textbooks do not mention familial factors in their discussions of etiology. The disseminated form has not previously been reported twice in the same family. This in itself should not exclude familial factors from consideration in the etiology since the rarity of the disease may account for its failure to strike the same family more often.

Cluxton[4] has summarized the various factors which have been considered in the etiology of lupus erythematosus. The theory of tuberculous infection has been virtually discarded by American authorities. In this country the view has prevailed that lupus erythematosus is a disease of multiple etiology, mostly vascular and allergic responses to a multiplicity of toxic or infectious agents. The English theory of a streptococcal etiology might fit in as one facet of this American view. The streptococcal etiology has recently received support from Welsh[5] who isolated a single strain of streptococci from sixteen patients with the disease. He was able to show that the strain was serologically identical and he also demonstrated a specific relationship of the organism to the patients by precipitin reactions. It is conceivable that a common organism affected the two sisters reported but it must be remembered that a year elapsed between the death of case 1 and the first symptoms of case 2. Ayvazian and Badger[6] studied three cases in student nurses which occurred after the administration of Dick toxin and typhoid vaccine. They felt the disease was a manifestation of the systemic effect of an antigen-antibody reaction which had become irreversible. Stokes, Beerman and Ingraham[7] have attempted to integrate the presumed etiologic factors of this disease. They conclude that lupus erythematosus is a manifestation of vasculo-allergic or infectious-allergic mechanisms in an unusually reactive individual. They do not mention familial factors although it would seem that the type of mechanism they postulate might show a familial incidence. The requirement of a peculiarly sensitive and reactive individual might conceivably be a common factor in identical twin sisters.

It is interesting to study the family of these twins. The family shows a tendency to twinning and to unexplained early deaths. The twins had two uncles on their father's side who died in teen age of an unknown cause. On their mother's side they had an uncle who died in teen age and an aunt who died at the age of 8, both of an unknown cause. We have been unable to determine whether any of these individuals had a skin rash or other symptoms of lupus erythematosus. There was a great-uncle who died at the age of 68 of diabetes. He was the only other known diabetic person in the family.

There has been an increasing interest in the relationship of the endocrine system to disseminated lupus erythematosus ever since Contratto and Levine[8] in 1939 treated a case with a sterilizing dose of x-ray to the ovaries. They reasoned that the tendency of the disease to affect females of the menstruating age pointed to an endocrine factor. Their patient improved at first but later died of pneumonia. Rose and Pillsbury[9] described a premenstrual accentuation of chronic discoid and disseminated lesions. They also found a decreased 17-keto steroid:estrogen ratio in the urine of one male with lupus erythematosus. They felt this indicated some evidence of increased pituitary gonadotrophic activity. They treated six cases with testosterone but their results were inconclusive. They also treated five cases with surgical castration or irradiation and observed one case through the menopause. The patient observed through the menopause improved and one of their castration cases strikingly improved. Lamb et al.[10] found evidences of disturbed ovarian function in thirteen women with lupus erythematosus. They treated seven patients with steroid hormones with beneficial results.

Despite all this interest, it is rare for patients with lupus erythematosus to have any demonstrable endocrine disease associated with the condition. The two cases of Zeisler and Bluefarb[1] had thyrotoxicosis associated with the subacute and chronic forms of the disease. These are the only cases of endocrine disease that we have found reported with lupus erythematosus. The pathologic findings at autopsy do not show any predilection for the endocrine glands. The findings which have been reported mainly affected the stroma of the glands, not the parenchyma. At the present time any definite relationship of the endocrine system to lupus erythematosus remains to be proved.

Our case 1 had had diabetes for fifteen months before the definite onset of lupus erythematosus.

However, her diabetes always was difficult to control and it was felt that there was some other factor involved, making the diabetes relatively insulin-resistant. Unfortunately we were unable to obtain an autopsy to determine whether the islets of Langerhans were affected by the lupus erythematosus.

Diagnosis of obscure cases of disseminated lupus erythematosus has been facilitated recently by the finding of a peculiar cell in the bone marrow. This was described by Hargraves et al.[11] who named it the "L. E." cell. It is a polymorphonuclear leukocyte which has engulfed a large, homogenized, smoky blue material apparently of nuclear origin. They also described rosettes of polymorphonuclear leukocytes clustered around masses of bluish staining material. They felt that the L. E. cell was the end result of a process of nucleolysis, chemotaxis and phagocytosis. These cells were demonstrated in the bone marrow of Case 2 (fig. 1).

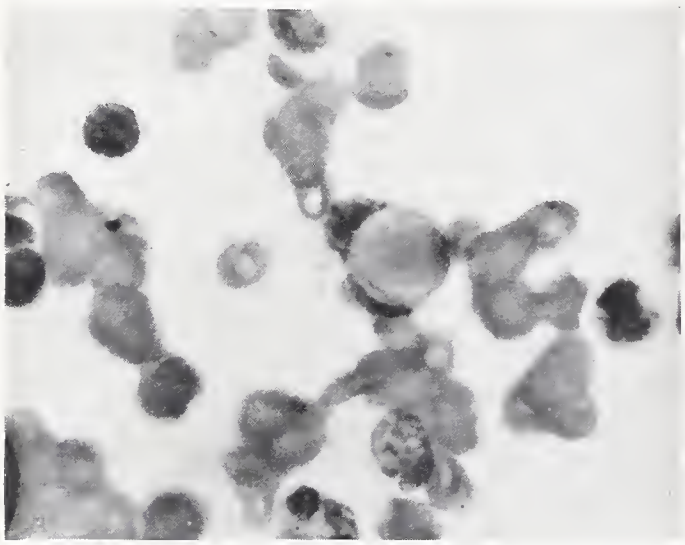


Fig. 1. "L. E." cell showing inclusion body in a neutrophil, pushing the nucleus and the granules to the periphery of the cell. Wright's stain, x 1200.

Berman et al.[12] were able to produce this cell in normal bone marrow by incubating it with serum from patients with disseminated lupus erythematosus. They believe the reaction is due to a gamma globulin in the serum of patients with disseminated lupus erythematosus. They suggest that this reaction can be used as a test for the disease in suspected cases. The finding of the L. E. cell in bone marrow is not in itself qualitatively diagnostic because Berman et al. have observed it in other conditions. However they feel it is quantitatively significant because disseminated lupus erythematosus is the only disease in which it has been observed in large numbers. The L. E. cell has not been observed in the subacute and chronic forms of lupus erythematosus which suggests a fundamental difference from the disseminated form.

SUMMARY

1. Two cases of disseminated lupus erythematosus in identical twin sisters are presented. One of the cases was associated with a preceding diabetes mellitus. Both cases steadily progressed to a fatal termination.

2. The relationship of disseminated lupus erythematosus to constitutional and endocrine factors is discussed.

3. One case was corroborated by the finding of L. E. cells in the bone marrow. The significance of this finding is discussed.

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If you want to lose weight, the advice of a Springfield, Mass., physician is that one try dieting instead of exercise. In his opinion, dieting is "much safer and easier."

Dr. Max Millman, in the current issue of *Today's Health*, published by the American Medical Association, pointed out that bodies burn up comparatively few calories by exercise. In walking three miles, one burns up the energy contained in a couple of glasses of milk or a 5 cent candy bar.

"To lose a pound of body fat by dieting is simple," said Dr. Millman, but to lose the same pound by physical activity one would have to saw wood for ten and one half hours, lay 14,731 bricks, do carpentry for 30 hours, shovel 114,000 pounds of sand, run forty three miles or wrestle five and one half hours.

Even then, exercising does not insure weight loss, he said. "Exercise without dieting not infrequently causes a gain rather than a loss in weight. Physical activity increases the appetite and often leads to a calorie intake far greater than that expended during the exercise."

The most serious objection Dr. Millman has to physical exercise as a reducing agent is the harm that may result from "injudicious and indiscriminate use." He said this is particularly true where fat people of middle age are concerned. Even when he is resting, the fat person's heart is working overtime. Straining the heart further with vigorous exercise could be dangerous.



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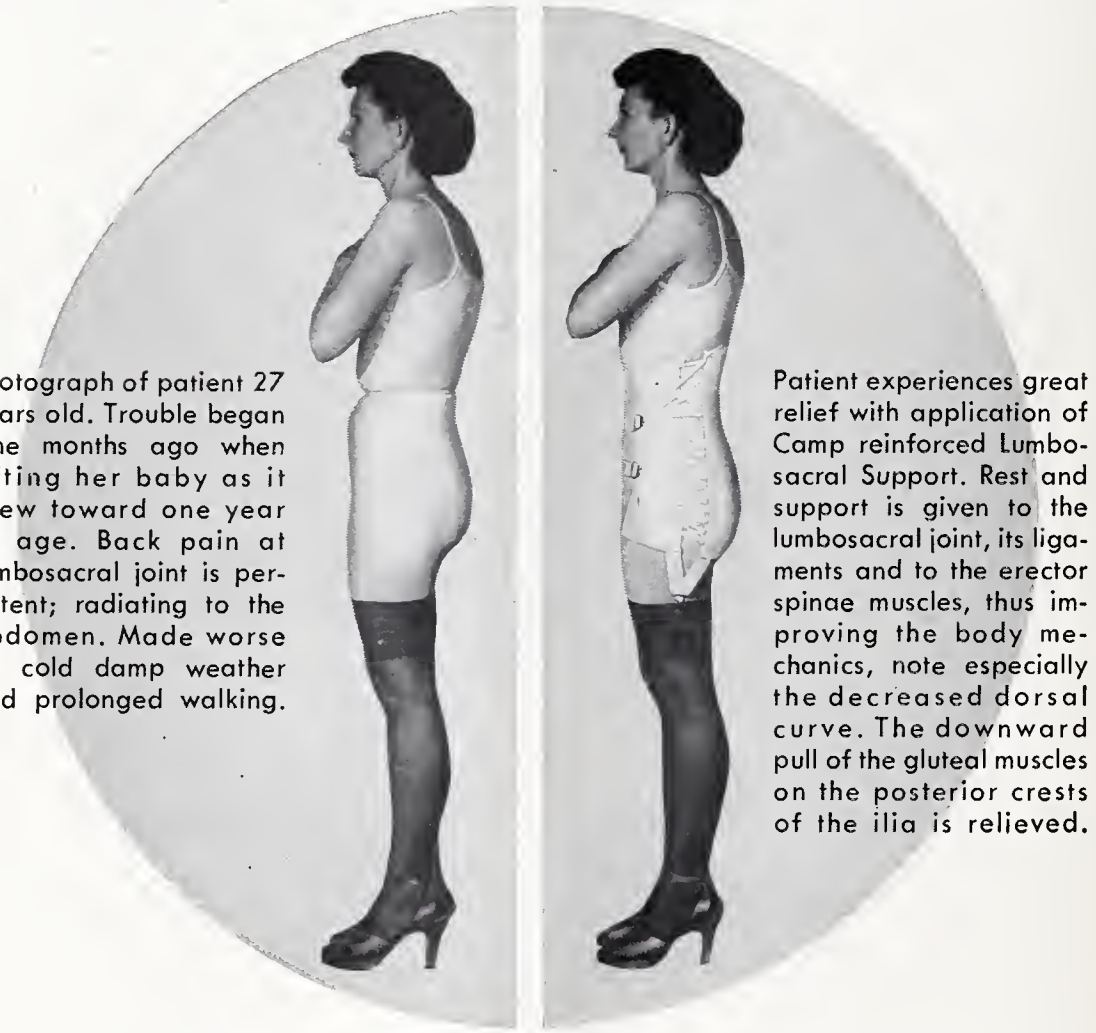
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Postgraduate Review

ADVANCES IN ALLERGY

CLEMENT J. SULLIVAN, M.D.
ST. LOUIS

NONSPECIFIC THERAPY

THE EMPLOYMENT of Cortisone and ACTH in clinical allergy and experimental hypersensitivity has shed considerable light on the mechanism of perpetuation of the pathology of these perplexing states. Although neither of these hormones permanently or completely abolishes the state of hypersensitivity, they successfully modify one aspect of the allergic response to a greater or lesser degree. In chronic or protracted states of hypersensitivity this modification of the response persists only as long as the hormone is administered.[1] The successful modification of the response is of such high degree in most instances that at the present time these substances may be considered the yardstick by which all other measures of symptomatic therapy may be measured.

Although the mechanism by which Cortisone and ACTH exert their beneficial effects is by no means completely understood, considerable information has been accumulated during the last two years concerning their mode of action. Profitably one may consider some newly uncovered information, and some old principles in the field of experimental allergy.

When a normal animal is injected intravenously with a foreign substance it finds its way rapidly into the cytoplasm of certain cells. These cells are known collectively as the reticulo-endothelial system and include the Kupffer cells of the liver; the tissue histiocytes, or mononuclear cells, which are widely distributed in all tissues; the reticular cells of the lymph nodes and spleen; and the endothelial cells of certain vessels. That foreign materials do enter these cells can be shown by labeling the foreign substance in various ways.[2] If the component parts of the substance are of "large size" they are retained in the cells for long periods of time, even several months.

If the total quantity of foreign material is relatively small the reticulo-endothelial system picks it up in an apparently effortless manner. By this is meant that the pathologist examining such tissues would be unable to detect evidence of pathology if the foreign material were not tagged in some special manner. If the quantity of foreign material is relatively large the pathologist is able to observe changes.[3] One of these changes is the appearance of an abnormal number of reticulum cells, that is, cells of the histiocyte variety presumably at the site of the entrapped material.

The tagged foreign material can also be found in connective tissue that lies between and around parenchymal cells of all organs. And if the quantity of foreign material injected is large these areas of intercellular connective tissue show evidence of swelling; there is also proliferation of fibroblasts. All of these changes occur in the normal animal soon after the foreign material has been introduced.[4] Providing that the quantity of foreign material is not too massive, the animal appears to be in a state of good health.

As a result of this picking up of foreign material by these tissues, specific antibody may be formed.[5] Thus entrance of the foreign material into the diversified and widely distributed cells of the reticulo-endothelial system appears to be one of the first steps in an otherwise poorly understood sequence of events which leads ultimately to antibody formation.

After passage of about two weeks time antibody level becomes high. If at this point the animal is reinjected with the same foreign material, various things take place. The animal may die in anaphylactic shock shortly after the injection. There is considerable evidence to indicate that anaphylactic shock is produced by antigen-antibody union, and that the liberation of histamine or a similar substance is intimately related to the union of these two substances.[6]

It is at this point that the antihistaminic drugs are of value. In the experimental animal that has been pretreated with a potent antihistaminic drug, no anaphylaxis develops following the second injection.[7] There are certain clinical allergic reactions which closely resemble anaphylaxis since the reaction occurs within a very short period of time following reexposure to the allergen. Such clinical reactions can be treated satisfactorily with the antihistaminics. It is in this same type of clinical reaction that adrenalin is of specific value.

At the same time that anaphylaxis is likely to occur there are changes of a dynamic nature which occur in the small blood vessels.[8] The arterioles and venules undergo changes in their caliber, caused by alternate bands of constriction and dilatation. This phenomenon persists for a matter of minutes and by analogy is likewise attributed to antigen-antibody union. It is followed by a phase of vascular dilatation. It is of interest that the capillaries do not participate actively in this constriction dilitation phemonenon. Platelets appear to adhere to one another and shortly thereafter stick to the vascular endothelium in spots.[9] This results in a platelet mass attached to the endothelium with formation of a white thrombus. Red thrombus formation necessarily follows, with patchy vascular occlusion. These vascular dynamic and thrombotic changes are the initial stages of the Arthus phenomenon[10] which has in the past been conclusively shown to be dependent on the presence of circulating antibody.

Other changes also take place in this animal previously sensitized and now reinjected. It has in the past been thought that these other changes

which will be discussed later, have also been the result of antigen-antibody union. However, as will be seen, some doubt now arises as to the importance of an antigen-antibody reaction as a completely satisfactory explanation of these other changes.

Once more the reticulo-endothelial system and the intercellular connective tissue fibrils are called upon to pick up this foreign material. This picking up of foreign material might well be considered a good response on the part of the host in order to protect other portions of the body from contact with the foreign substance. It is known that in the normal animal injection of a large amount of foreign material produces visible abnormal changes. If one now presents these tissues with another large quantity of the same foreign material, and if these tissues are already "loaded," one might visualize the production of disease in these tissues perhaps by a process of specific overloading. The actual changes which occur in these tissues resemble in many respects the changes which were noted in the normal animal,[11] except that, after the passage of about five days, there is an additional change which consists of polymorphonuclear leukocyte infiltration in these same areas. This may progress to actual necrosis in patchy areas, and this is particularly prone to occur in the walls of small arteries.[12]

If the animal has been treated with Cortisone or ACTH prior to the time of the second injection, it may still develop anaphylaxis[13] and the concomitant dynamic thrombotic vascular phenomena, but it will not develop the five day later necrotic changes.[14] There has been insufficient experimental observation to know whether or not the intermediate changes due to participation of the reticulo-endothelial cells and the connective tissue fibrils are present or absent in the treated animal. However, it is most probable that they do not occur since necrosis does not occur, and it appears that necrosis may be a late manifestation of the intermediate inflammatory response of these tissues.

There is considerable evidence to indicate that circulating antibody is not directly suppressed by the administration of Cortisone or ACTH.[15] Therefore our treated animal may develop anaphylactic shock and the accompanying dynamic-thrombotic vascular changes, because these are a manifestation of the effect of antigen-antibody union. The fact that our treated animal will not develop five day necrosis, and will probably not develop the reticulo-endothelial system connective tissue intermediary inflammatory reaction, strongly suggests that these phenomena may not be dependent solely on antigen-antibody union.

If a "nonallergic" patient is successfully treated with Cortisone or ACTH, and at the height of his improvement and treatment is passively sensitized with serum from an individual with ragweed hay fever, his sensitized skin site when tested with ragweed pollen antigen will exhibit a positive allergic reaction.[16] Thus the Cortisone treated individual is capable of reacting to antigen-antibody combinations, which suggests that those diseases which are successfully treated with Cortisone or ACTH may not be exclusively manifestations of antigen-antibody reaction.

Our experimental animal has therefore apparently developed two types of hypersensitivity as the result of the introduction of one foreign substance. One type of hypersensitive reaction is due to union of specific antigen and its antibody. The other type of hypersensitive reaction may not be due to union of antigen and antibody, but nevertheless followed in the wake of injection of the antigen.

If these late and intermediate lesions are a manifestation of specific overloading, how might it be possible for Cortisone and ACTH to prevent the overload phenomenon and at the same time allow the animal to remain healthy? It is to be recalled that picking up of foreign material by these tissues is almost certainly an expression of good defense. In the presence of an excess of these hormones it is possible that the body economy is changed in some fashion so that it is unnecessary for foreign material to be trapped in these defensive tissues.

Another explanation, and perhaps a more acceptable one, is that foreign material is quite properly picked up by this defensive system, but that in the presence of an excess of these hormones it is much more rapidly metabolized. This might then allow this system to pick up and rapidly to dispose of foreign material thus greatly increasing its efficiency and allowing it to deal with a much larger work load before it becomes embarrassed.

It has been shown that prolonged administration of these hormones will eventually result in a disappearance of circulating antibody.[17] This is not surprising if the first step in antibody production, which is picking up of foreign material by the reticulo-endothelial system, is not allowed to progress in its usual fashion. It must be remembered that this disappearance of antibody is a late occurring phenomenon, manifesting itself long after clinical improvement has begun.

It is generally accepted that experimental and clinical allergic states may be relegated to either one or the other of two broad types. These are the anaphylactic and the tuberculin types. In the past it has seemed logical to classify the group of so-called clinical allergic diseases as belonging to the anaphylactic type. Insufficient attention has been paid to any possible tuberculin type component of such diseases as asthma, hay fever, chronic urticaria and the other members of this group. It is to be recalled that the tuberculin type of allergic reaction is apparently not dependent on the presence of free circulating antibody. It now appears that this classification may be inaccurate and that no more than a small fraction of clinical allergy may be completely comparable to anaphylactic shock

in the experimental animal, and as such dependent solely on union of antigen and antibody. For if the delayed allergic reaction is suppressed by Cortisone or ACTH; if chronic clinical allergic disease is symptomatically eradicated by these hormones; and if anaphylactic shock is not modified, it is likely that most chronic clinical allergy is more properly of the delayed or tuberculin type of allergy, at least in part of its disturbed physiology.

If this is in fact the process which is followed in the production and maintenance of chronic allergic disease, then antibody production might be a secondary manifestation as a result of the disease process. As such antibody would then be concerned with future protection and not with present perpetuation of the disease. Future protection by antibody would consist of union with, and thus neutralization of, future antigen prior to its potential entrance into the reticulo-endothelial system. In the case of free circulating antibody its union with future antigen would produce anaphylactic shock or the Arthus phenomenon. In the case of leukocyte contained antibody of the tuberculin type the union would perhaps result in phagocytosis.

The case of pneumococcal pneumonia might be considered as remotely analogous. Certainly there is at first glance nothing in the clinical course of pneumococcal pneumonia which suggests an anaphylactic type of reaction. However, skin sensitizing antibody appears shortly before the crisis, and can be demonstrated, at least in some types of infection, by injecting into the skin an extract of the capsular polysaccharide derived from the same type of pneumococcus as that which is causing this particular case of pneumonia.[18] It appears certain that this antibody has been formed as a result of capsular polysaccharide having been taken up by the reticulo-endothelial system early in the course of infection. Here then one has an allergic antibody without allergic disease occurring as a result of its presence. Were one to inject intravenously the same type of capsular polysaccharide into the patient convalescent from pneumonia, would he develop anaphylactic shock? It is probable that he would. It is perhaps beside the point, but conceivable that some of the terminal manifestations of fatal pneumococcal pneumonia such as right heart dilatation, pulmonary edema, and the shock of circulatory collapse, are perhaps anaphylactic manifestations.

A more proximal analogy would be a different state of affairs in which there was a much less massive and much more protracted ingress of pneumococcal antigens. As a result of this one might produce reticulo-endothelial specific overload manifested as a chronic clinical allergic disorder. Skin sensitizing antibody would be continuously produced, but its participation in the clinical picture would depend on secondary factors which would govern the presence or absence of free capsular polysaccharide in the circulation.

It has recently been found that during the course of pollen hay fever the individual may become completely asymptomatic within a few hours to a day or two after the initiation of ACTH or Cortisone therapy.[19] However, careful studies have shown that there is no decrease in the quantity of circulating skin sensitizing antibody; nor does the patient's serum diminish in its ability to transfer passively this sensitivity to normal skin.[20] This is indeed surprising for one would have thought that pollen hay fever was the classical example of a clinical allergic state the manifestations of which were based in large part on antigen-antibody union.

In summary, it may be said that Cortisone or ACTH therapy is clinically effective only during its time of administration plus an additional period of about ten days, in the treatment of clinical and experimental allergy of the predominately non-anaphylactic type. At the end of the ten day period the disease will recur if conditions are favorable for the reintroduction of antigen into the reticulo-endothelial system. The anaphylactic type of reaction is readily controlled with the antihistaminic drugs and adrenalin, at least in that group of diseases commonly classified as clinical allergy.

It is however obviously true that the antihistaminic drugs are not wholly valueless in the treatment of many of the allergic states that are satisfactorily controlled by Cortisone or ACTH. Seasonal hay fever is the most outstanding example. At the present time there appears to be no sensible explanation for this other than the assumption that there are two components to this type of disease, an anaphylactic and tuberculin component.

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HISTORY

A 28 YEAR OLD gravida 2, para 1 female was admitted to the Obstetric Service at 10:45 p. m., on May 24, 1950, in active labor. After an uneventful labor of six and one half hours' duration, she delivered an apparently normal male infant.

Past History.—General health was good. She had had an appendectomy. She had a history of "pyelitis" during a pregnancy in 1940 and a second episode in 1947. There were no other serious illnesses or operations.

Present Illness and Course in Hospital.—The present pregnancy had been uneventful except for excessive weight gain (137 to 164 pounds). The patient bled excessively from the vagina thirty minutes after delivery. Her blood pressure dropped to 70/50 and she became cold and clammy. Glucose, plasma and blood were given with a rise in blood pressure to 100/78 after four hours. Following this, the patient became oliguric with a maximum urinary output in twenty-four hours of 200 cc. Urine at first was "port wine" in color, contained 4 plus albumin and an occasional red cell. Specific gravity was 1.017. There was no icterus and no hemoglobinemia. Hemoglobin was 4.7 grams with red blood count 1,700,000.

The patient was given parenteral fluids to equal 1,000 cc. plus 24 hour urine output. These fluids included 10 per cent glucose in saline solution, 5 per cent saline solution, 1/6 molar lactate and blood.

On May 29 the patient's blood pressure began to rise and reached 200/94. On May 30, the patient became confused and had frequent clonic convulsions which were uncontrolled by barbiturates and magnesium sulfate and she began to pass larger amounts of urine (from 2,000 to 3,000 cc. per 24 hours). The blood electrolytes showed improvement. She developed considerable rhonchi in the chest and her temperature rose to 102.4 F. Penicillin, 100,000 units, and streptomycin, 0.5 gm., were given every three hours.

A lumbar puncture on June 2 revealed an initial pressure of 330 mm. Fifteen cc. of fluid was withdrawn and the final pressure was 200 mm. The Pandy test was 1 plus and spinal fluid protein was 78 mg. There were no cells.

Total fluid intake was restricted to 2,000 cc. daily and 25 gm. of salt free human albumin was given intravenously.

The patient continued to have convulsions. The blood pressure remained high. A continuous caudal anesthesia was started at 7:30 p. m. on June 2.

Respirations became shallow and irregular. Apparently diaphragmatic in origin, she became cyanotic and expired on June 2 at 8:30 a. m.

Electrocardiogram on May 28 showed normal mechanism and on June 2 showed right axis deviation. Urine examinations showed variations in specific gravity from 1.005 to 1.017. Albumin varied from 4 plus to 0. Microscopic examination on May 27 showed an occasional hyalin, cellular and granular cast, the latter being suggestive of heme casts.

SUMMARY OF LABORATORY DATA

Date	White Cell Count	Red Cell Count	Hb. gm. per 100 cc.	Nonprotein Nitrogen mg. per 100 cc.	Creatinine mg. per 100 cc.	Chlorides mg. per 100 cc.	CO_2 Value per cent	Na. Mg.	K. Mg.
May 25	25,900	2.82	8.3						
May 26	14,600	1.70	4.7	42	5.8	550	42		
May 27	13,150	1.96	5.2	62		540			
May 29		1.84	5.3	123		520	39	127.4	5.7
May 31	22,500	3.60	10.9	118		510	24	132.4	6.6
June 1	17,850	3.60	9.9	125		500	33	134.	7.9
June 2	22,200	4.12	10.5	123		545	42	140.	6.3
June 3	31,250		9.9	145	7.1				

DISCUSSION

RALPH A. KINSELLA, M.D.: The patient was a young woman. The only thing of interest mentioned in the past history was that she had pyelitis during her first pregnancy, and had had no other serious illnesses.

There was a uterine hemorrhage immediately postpartum which evidently resulted in shock. Following this, the patient passed urine which is described by the expression "port wine." It is interesting to speculate about where the writer got that idea. The expression "port wine" color of the urine appears in textbooks and one wonders whether he was thinking of that chapter when he wrote this description or was really trying to describe the color of the urine.

Then came the treatment with a great deal of fluids, 1/6 molar lactate, and the patient proceeded to have renal failure. Urinary output stopped, nonprotein nitrogen rose to high levels and the blood pressure rose. Then all of this treatment failed. Among other forms of treatment, there was the extensive use of barbiturates.

There was a consistent leukocytosis, a falling red count following the hemorrhage with a rise to fairly normal nevel before death, and a hemoglobin

Presented at St. Louis University School of Medicine, October 19, 1950.

that followed the trend of the red count. The nonprotein nitrogen and creatinine reached great heights, the serum chlorides fell and rose, CO_2 was maintained at a fairly good level, sodium fell probably as a result of hemodilation following the hemorrhage and the potassium did not vary greatly.

Now, the urine showed a good variation in specific gravity and urinary excretion was resumed before she died; nevertheless, death evidently was due to renal failure. The urine contained hyalin,

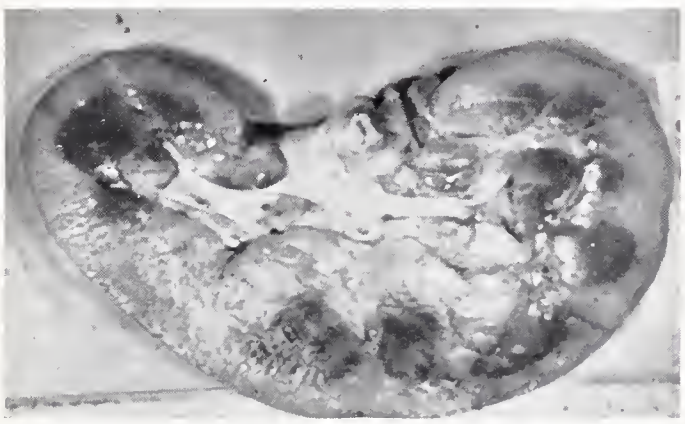


Fig. 1. Gross appearance of the kidney. The kidney is moderately swollen and shows a distinct, markedly pale cortex and congested medulla.

cellular and granular casts but there were only a few red blood cells and there is no reference to pus in the urine.

She was given 25 gms. of salt free plasma which is not adequate to raise the intravascular osmotic pressure. About 50 grams a day are necessary. The salt free albumin probably was given because the plasma protein had fallen. There is no reference to edema so I do not know exactly why the salt free human albumin was given.

There are three things that it seems to me might be proposed from this narrative. One might think about renal failure that had something to do with pregnancy and that may have been foreshadowed by the previous attack of "pyelitis" during the previous pregnancy.

Next is the question of lower nephron failure precipitated by shock. The shock in this case was the result of hemorrhage.

The third possibility which seems to me has some appeal is the "port wine" urine and the question of porphyria which is suggested by that description, if it means anything. Dr. Muether, would you discuss the question of lower nephron failure?

R. O. Muether, M.D.: The only diagnosis that I felt was tenable was lower nephron nephrosis. Most everyone is familiar with the work of Truetta. His idea of shunts captured the imagination of the physician but, unfortunately, a great deal of work which has now been done would lead one to believe that this shunting mechanism probably does not work except in the terminal state. If that is true, then, of course, one of the possible explanations for this peculiar syndrome has been taken away. Now, lower nephron nephrosis, as I think the pathologists will agree, is really not entirely limited to the lower nephron but involves other parts of the kidney and terminally produces a condition not unlike that of uremia from any other renal disturbance; however, the difference fundamentally is that lower nephron nephrosis is of acute onset and is characterized by marked changes in the electrolyte balance and may affect patients who have not had previous renal disturbances. The things that produce it most frequently are incompatible blood transfusions, burns, certain types of surgical procedures with shock, crushing injuries which may cause the liberation of an X substance which severely damages the kidney, producing anuria.

If the patient has this disease and can be kept alive, either through the judicious use of fluids and electrolytes and perhaps aided by an "artificial kidney" which may take the form of peritoneal or gastric lavage or one of the more elaborate cellophane tube arrangements, for six to eight days, the patient usually will show improvement and may recover completely. The patient under discussion went into shock soon after her delivery, and also lost a great deal of blood since the red count dropped to 1,700,000 and the hemoglobin was 4.7 gms. Inasmuch as she had been pregnant, there is a possibility that she may have had some anemia before and Dr. Broun might like to discuss that.

This patient was treated satisfactorily and the fluid intake was correlated with the urinary output. It perhaps should be emphasized that one must consider as part of the output not only the urine but also fluids that are lost in respiration, sweat and feces so that the idea of giving 1,000 cc. more than the amount excreted by the kidney is a good one but more fluid is sometimes necessary. If the patient can be weighed, that is a satisfactory way of judging the state of hydration. Maintain the patient's weight but do not permit them to gain or lose excessively. A patient may retain from 8 to 10 pounds of water before edema can be detected.

Apparently the sodium and potassium content of the blood was watched rather carefully as early in the illness the sodium was a little low and was returned to fairly normal levels but terminally it seemed just a little high. The explanation for this is not immediately obvious.

G. O. Broun, M.D.: I am in general agreement with what seems to be the prevailing diagnosis, lower nephron nephrosis. There is one statement here that may be significant. The patient had a severe hemorrhage and the red count was found to be 1,700,000. The patient was given parenteral fluids, including a unit of blood, and the next statement describes the port wine color of the urine. It might be that the blood was in some way incompatible producing a hemolytic transfusion reaction with hemoglobinuria. Now understand, I think that the severe hemorrhage of itself could be sufficient to produce a lower nephron nephrosis. The shock which accompanied this hemorrhage would be sufficient but it might have been that "insult was added

to injury" by a transfusion reaction at that point as suggested by the marked hemoglobinuria.

About the question of the blood picture, the first blood count that is given, on May 25, red cell count 2.82 with a hemoglobin of 8.3, is fairly normal as to color index and would therefore be consistent with the picture of acute hemorrhage because a person who has a normal blood picture, e.g., normocytic before the beginning of a hemorrhage, will have no change in the cell indices immediately afterward. They will be the same as they were just before the hemorrhage. If this patient had had an anemia of pregnancy, it might, of course, be a macrocytic anemia, the so-called pernicious anemia of pregnancy, in which there is a high color index. The first blood count on this patient does not suggest such an anemia. One may have iron deficiency anemias associated with pregnancy, particularly if there is repeated small hemorrhage, or sometimes, the demands of the foetus may cause an iron deficiency anemia. The macrocytic anemia is the more common. I feel that in this case the hemorrhage itself was severe enough to produce the anemia and that one is dealing with an anemia of acute hemorrhage.

The elevated leukocyte count is not surprising for one may get marked elevations of leukocyte counts in acute hemorrhage. I do not think that one need bring anything else into this picture of acute hemorrhage to account for the marked leukocytosis.

The renal damage apparently developed suddenly after hemorrhage and the hemorrhage may account for the continuation of the symptoms—the total duration of the disease was only about a week.

Dr. Muether: Was she given blood while she was anesthetized, I wonder? Maybe the pathologist would know that.

H. T. Blumenthal, M.D.: No she was not. The first transfusion was given after delivery.

Dr. Muether: The reason I asked that question is that if she were under an anesthetic and were given incompatible blood, the reaction would not be manifest and might be missed.

CLINICAL DIAGNOSIS

Lower nephron nephrosis.
Severe anemia.

Dr. Kinsella: Dr. Blumenthal, will you give the pathologic report?

Dr. Blumenthal: Supposing that you were in the pathologist's situation and were confronted with a clinical abstract in a case of pregnancy; you were about to perform the autopsy and in that clinical abstract there was evidence of renal failure with an oliguria, ascending nonprotein nitrogen and all of the other evidence that was discussed. What would you consider as possible findings in the kidney, that is gross findings, which would aid in at least making a provisional anatomic diagnosis? I think that Dr. Kinsella has pointed out one with respect to pyelitis. And there is some indication that this patient had had a bout of pyelitis during the previous pregnancy. If that were the case, one would expect to find scarred kidneys with either wedge or U shaped scars which would be indicative of a chronic pyelonephritis. Then it also is known that patients with benign hypertension may go into a more severe phase of their hypertension followed by uremia during pregnancy. In those, of course, one would expect to find a finely granular kidney. The evidence clinically, of course, is against such an expectation since this patient had a normal blood pressure preceding the delivery.

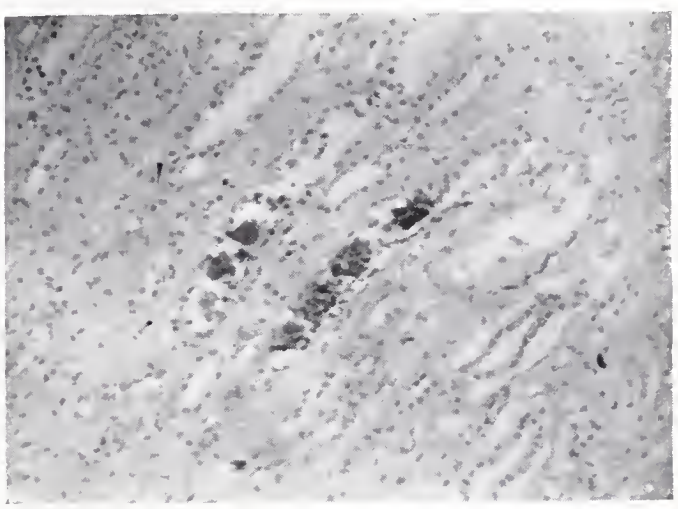


Fig. 2. Section of medulla of the kidney shows heme casts within the collecting tubules. Magnification approximately 500 times.

She might have had an old glomerular nephritis. Again, there might occur a more severe exacerbation of the hypertension and development of uremia during the pregnancy, perhaps becoming more severe about the time of delivery. If such were the case, one would expect to find the small contracted kidneys of a chronic glomerular nephritis.

Supposing this patient were an eclamptic? That diagnosis, I think, was not completely ruled out in the discussion. One would then expect to find, in addition to evidence of hepatic necrosis, perhaps, large, relatively pale, swollen kidneys.

I think there is one other diagnosis which the pathologist might consider in a case of this type and that is bilateral, cortical necrosis, which is in itself a rare disease but which is more often associated with pregnancy than with any other condition. This terminology is more or less self explanatory—there is a complete necrosis of the whole cortical area of both kidneys and such cases show a terminal picture of oliguria and uremia. Against that diagnosis in this case is the fact that with respect to kidney function this patient was actually improving at the

time that she died. She had again started to put out urine, her blood sodium and the other crystalloid elements apparently were comparatively normal.

And then, finally, is the diagnosis which the discussants made, that of lower nephron nephrosis. What is there in pregnancy that would predispose a patient to such a situation? First, I think, a traumatic type of labor might do it so that, actually, one might have in the uterus a release of myohemoglobin similar to that which occurs in crushing injury, the lesion with which this renal picture is most commonly associated. Then, of course, there is the possibility of hemorrhage and shock which was mentioned and which I think is probably the most important contributing cause in this case. And, finally, there is the possibility of a transfusion reaction.

Each lung weighed 430 grams. The lower lobes were rather full in consistency. The external surfaces were grey in color with some blue and black mottling. The cut surfaces varied in color from grey to dirty-grey to red to dirty red color. The cut surfaces were somewhat firm in consistency. In all lobes there were some patches in which the tissue was even more firm and these were grey in color. Purulent material could be expressed from all lobes. There appeared to be some congestion also in several areas. The bronchi contained much mucopurulent material; the pulmonary vessels appeared normal. On microscopic examination, almost all of the alveoli are filled with an organizing inflammatory reaction. This is accompanied by metaplasia of alveolar and bronchiolar lining cells into large swollen cuboidal epithelium. There is marked diffuse vascular congestion.

Each kidney weighed 330 grams. The surfaces of the kidneys were smooth (fig. 1). No scarring was present. The capsule stripped readily. The surfaces showed marked pallor with a small amount of purple splotching in between. On cut section there was minimal bulging of the cut surface. The cortex and medullary rays showed marked pallor. The medullae were prominent and appeared congested. The pelves showed no abnormalities. The cortices were thickening, measuring 1.2 cm. in thickness. On microscopic examination the glomeruli are fairly well preserved. The tubules in both cervix and medulla are moderately dilated but the lining epithelium is not swollen. Many distal convoluted and collecting tubules are filled with heme-casts and lined by a trophic epithelium (fig. 2). Some of the epithelial cells contain a brown pigment. There is diffuse vascular congestion and a small area of medullary hemorrhage is noted. The cortical interstitial tissue is edematous and contains foci of lymphocytic and polymorphonuclear infiltration.

The uterus was markedly enlarged and weighed 1,000 grams. The cervix had a purple discoloration but no lacerations were present. The endometrial surface of the uterus showed hemorrhagic areas with some degeneration of the tissue evident. The myometrium was thickened to a diameter of 4 cm. The ovaries were slightly enlarged but otherwise were not remarkable. The rest of the reproductive tract appeared normal. Microscopic examination showed the inner surface of the uterus occupied by a thick layer of organizing hemorrhage which extends into the myometrium. There are also scattered foci of necrosis with polymorphonuclear infiltration which also extend into the superficial myometrium. In the latter are also noted a few degenerating syncytial masses.

Microscopic examination of the breasts shows well developed lobules of acini and ducts containing secretion, typical of postpartum breast tissue.

FINAL ANATOMIC DIAGNOSIS

Lower nephron nephrosis, marked postpartum uremia, clinical.

Organizing pneumonitis involving all lobes; toxic splenitis, marked; cloudy swelling of the liver, moderate.

Early postpartum involution of the uterus; secretory hyperplasia of the breasts, postpartum; right hydroureter, slight.

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Case Report

PANCREATIC ISLET CELL ADENOMA

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ST. LOUIS
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THE DALLES, OREGON
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BECAUSE OF THE relatively small number of proven cases of pancreatic islet cell adenomas, this report is made. This patient's clinical course emphasizes the fact that the condition must be diagnosed early and treated promptly before irreversible central nervous system changes occur.

The first case of hypoglycemia, due to a tumor of the islands of Langerhans, was reported in 1927 by Wilder[1] and associates with operative and necropsy findings. Since that time the literature on this subject has been voluminous, due to repetition. Whipple and Franz[2] have kept a record of reported cases and in 1944 Franz[3] had collected a total of 149 cases of islet cell tumor with hypoglycemia; 106 of which were benign, twenty-eight questionably malignant and fifteen proven malignant.

According to Whipple,[4] the clinical diagnosis of islet cell tumor of the pancreas is reasonably certain when the patient's symptomatology presents the triad of: (1) central nervous system disorder, (2) fasting blood sugar level of 50 mg. per cent or less, and (3) immediate recovery from hypoglycemic attacks following the administration of glucose by mouth or vein.

A patient fulfilling these requirements was admitted on Unit II Medical Service, St. Louis City Hospital, on July 3, 1949, and after a period of observation and study was referred to the surgical service with a diagnosis of islet cell tumor. This diagnosis was confirmed following operation.

REPORT OF CASE

M. K., a 73 year old woman of Bohemian extraction, was brought to St. Louis City Hospital by police after being discovered in her room in a semi-comatose condition. An adequate history was never obtainable from the patient because of language difficulties and because the patient was disoriented during the entire period of observation. On January 8, 1949, the patient fell and sustained a right Colles fracture and a one half inch laceration of the right temporal region. She was admitted to the fracture ward of City Hospital on January 8, 1949, and discharged on January 13, 1949. Urinalysis was negative, blood counts were normal and no other laboratory work was reported.

A neighbor who accompanied her to the hospital supplied the following information: Patient had degenerated progressively, both physically and mentally during the last six months. She had lost about sixty pounds and had remained in bed almost constantly during the last three months.

Physical examination revealed a restless and confused, well developed, but poorly nourished elderly white female. There was a slight enlargement of the heart and there was audible a grade II systolic murmur heard over the aortic area and a rough grade I apical systolic murmur. The blood pressure was 195/110. Examination of the other systems was not revealing. The reflexes were equal and active and no pathologic toe signs were elicited. Admission urinalysis was normal; the red blood count and hemoglobin estimation indicated mild anemia, of the microcytic type. Nonprotein nitrogen, blood chlorides and serum cholesterol esters were within normal limits. The blood Kahn was positive with quantitative estimation of forty units.

On July 5, 1949, the fasting blood sugar was reported as 8 mg. per cent. Repeated fasting blood sugar estimations ranged between 8 and 70 mg. per cent. The glucose tolerance test using 100 grams of glucose orally gave the following values: fasting 57 mg. per cent; 30 minutes 90 mg. per cent; 60 minutes 141 mg. per cent; 120 minutes 141 mg. per cent; 180 minutes 115 mg. per cent. This test, repeated ten days later gave the following results: fasting 0 mg. per cent; 30 minutes 82 mg. per cent; 60 minutes 105 mg. per cent; 120 minutes 164 mg. per cent; 180 minutes 200 mg. per cent; 240 minutes 105 mg. per cent; 300 minutes 61 mg. per cent. Radiographs of the skull revealed a normal sella turcica.

At 5:00 a. m. on July 13, 1949, the patient was found in a stuporous condition with stertorous respiration, generalized muscle twitching, slight perspiration and hyperactive reflexes. She was given 25 cc. of 50 per cent glucose intravenously and consciousness returned immediately. On July 14, 1949, an insulin tolerance test was attempted and twenty-five minutes after intravenous administration of 3 units of insulin the patient went into hypoglycemic shock which was again relieved with 50 per cent glucose intravenously. A fasting sample and a twenty minute sample of blood were obtained for sugar determination and were found to contain 17 and 8 mg. per cent glucose respectively. The patient remained stuporous with repeated episodes of deep sleep and hypoglycemic attacks. Repeated blood sugar estimations during these attacks measured 60 mg. per cent or less. The diagnosis of islet cell tumor was made and laparotomy was performed on August 2, 1949. Endotracheal nitrous oxide-ether anesthesia was employed. The abdomen was opened through a transverse incision across both rectus muscles. The gastrocolic ligament was incised and the pancreas palpated. No nodule could be felt in the pancreas; therefore, the tail of the pancreas was mobilized with the intention of resecting a portion of the pancreas. During this maneuver, a pink nodule, 1 centimeter in diameter, was discovered on the posterior surface of the body of the pancreas. Since the blood supply of the tail of the pancreas had been compromised in the search of the adenoma, it was deemed advisable to resect the tail and half of the body of the pancreas. This was accomplished along with splenectomy. The pancreatic duct was ligated. A biopsy of the liver was taken, and then the abdomen was closed with one drain to the

Drs. Sexton and Murphy, from the Medical Service of Unit II St. Louis City Hospital; Drs. Von Kaenel and McAfee from the Surgical Service of Unit II St. Louis City Hospital.

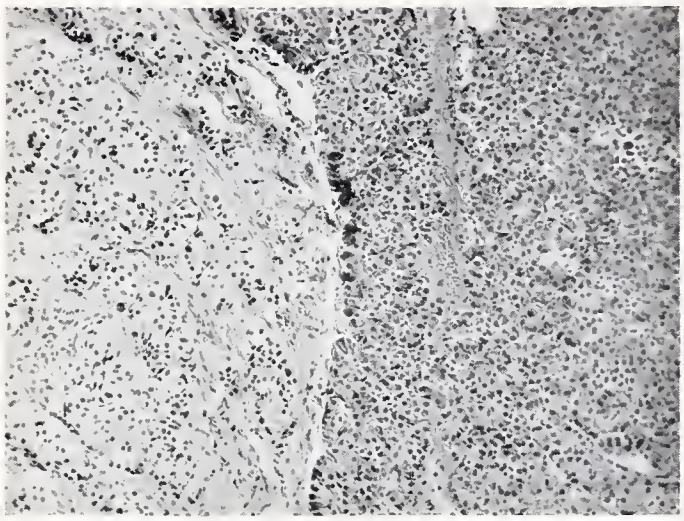


Fig. 1. Photomicrograph of margin of islet cell adenoma including adjacent normal pancreatic tissue. The adenoma appears on the right and is sharply demarcated; but in other areas of the periphery the demarcation was not so clear. H & E stain 185x.

pancreatic bed. Cotton sutures were used throughout.

Immediately following operation, the patient's fasting blood sugar measured 407 mg. per cent and over a period of several months declined to between 108 and 150 mg. per cent. A glucose tolerance test, done two months after surgery, gave the following values: fasting 80 mg. per cent; 30 minutes 172 mg. per cent; 75 minutes 225 mg. per cent; 120 minutes 243 mg. per cent: Initially, small doses of regular insulin were administered along with intravenous glucose, but in time insulin was withdrawn. The postoperative course was complicated by a persistent atony of the colon and a pancreatic cyst with partial necrosis of the omentum.

The adenoma* measured 1 centimeter in diameter and was pink. Figure 1 is a low magnification photomicrograph of the margin between adenoma and normal pancreatic tissue. Figure 2 reveals a high power photomicrograph of the adenoma. On microscopic examination, the hepatic cells appeared to contain more glycogen deposits than is normally observed. The presence of large deposits of glycogen in the liver, associated with hypoglycemia, indicates that in this instance, insulin shock could have been treated by the administration of adrenalin as well as by administration of intravenous glucose.

The patient's confusion and disorientation was indicative of the degree of central nervous system involvement. While she did improve somewhat following operation, she has not recovered completely after fourteen months. This is readily understandable, if one considers the pathology known to occur as a result of a prolonged and severe hypoglycemia. Anatomic changes in the brain that have been observed include multiple thrombi and perivascular infiltrations, notably in the basal ganglia and medulla oblongata; irregular dilatation of intracerebral vessels, and evidence of nerve cell degeneration. Layne and Baker[5] point out that any chronic disease such as arteriosclerosis is likely to result in irreversible cerebral changes when hypoglycemia occurs. Because of this patient's age, it is reasonable to assume that arteriosclerotic changes had occurred years previously. Furthermore, serious consideration must be given the findings of a high titer positive Kahn test as an important factor in the mental deterioration of this patient.

*Acknowledgement is made to Dr. John W. Saxton, Pathologist St. Louis City Hospital for preparation and interpretation of the pathologic specimen.

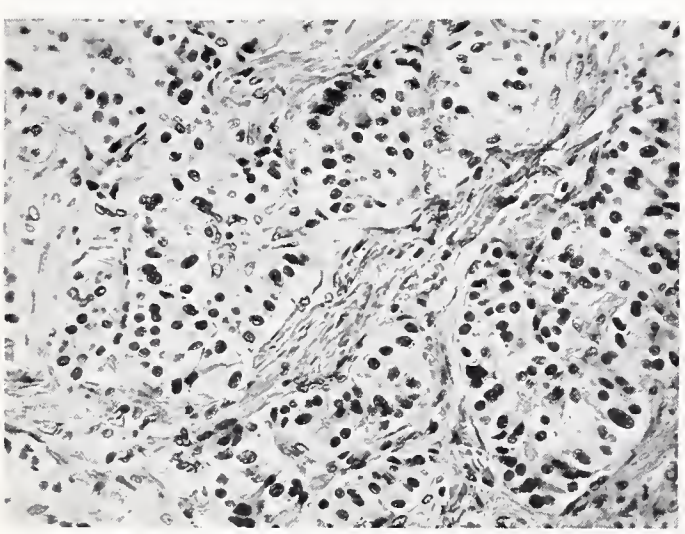


Fig. 2. Photomicrograph of representative area of islet cell adenoma showing the arrangement of the component cells in groups and columns. H & E stain 440x.

COMMENTS

As soon as an organic lesion of the pancreas is strongly suspected, operation should not be deferred. First, it is too difficult to control the attacks with glucose and, secondly, the longer the attacks continue the less likelihood for a reversal of central nervous system changes. One cannot be sure before operation of the pathologic condition present. The operator should be prepared for a painstaking search for a single, multiple or aberrant adenoma, or there may be generalized hypertrophy and hyperplasia of the islets of Langerhans.

SUMMARY

A case of pancreatic islet cell adenoma is reported in which lack of history helped to delay arriving at the correct diagnosis. Despite successful operation, the patient is still mentally deteriorated. Early diagnosis and prompt treatment are imperative if irreparable central nervous system damage is to be avoided.

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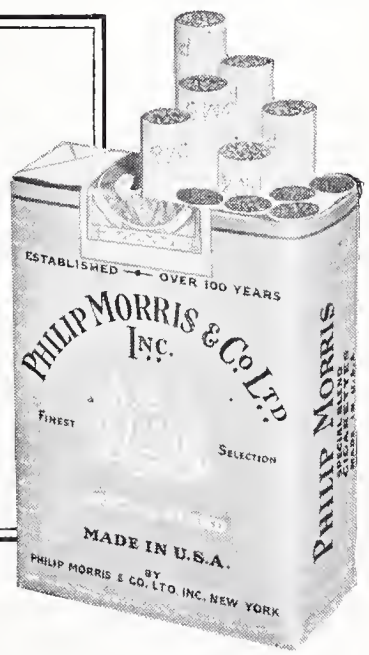
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Perloff, W. H.: Am. J. Obst. & Gynec. 58:684 (Oct.) 1949.

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Special Article

ILLUSTRATIONS FOR PUBLICATION

THE PREPARATION AND REPRODUCTION

PHILIP A. CONRATH
ST. LOUIS

MOST ARTICLES in scientific or clinical journals are illustrated either with drawings or photographs. Some of these illustrations are excellent, others are satisfactory but many of them are poor. Illustrations prepared by professional medical illustrators are, for the most part, good. Some of those prepared by an author himself are of high quality, revealing not only talent but an understanding of the requirements of the engraver to insure good reproduction. Unfortunately, many an otherwise excellent article is detracted from by poor illustrations. Often there may be too many rather than too few. They may be rendered in a technic which reproduces poorly, if at all. Illustrations are an important part of an article, or should be; otherwise, they do not justify their existence. They should be selected carefully therefore so that they may fulfill their function, which is to convey thoughts more quickly and simply than words. Kelly[1] has said, "Good true illustrations are a most valuable handmaid in medical instruction, for what the eye of the student has grasped remains, as old Horace memorably said, indelibly impressed after a fashion unequaled by the clearest verbal description. I would beg the reader, therefore, not to be satisfied with glancing over these illustrations and their legends, returning at once to the text, but to study each figure with care."

Illustrations include drawings, photographs, charts or any form of graphic illustration. Photographs and drawings may be reproduced either in black and white or in color. The various types of illustrations require different methods of reproduction although basically they are all subject to photoengraving. Drawings generally may be devided into two classes; namely, line drawings (pen and ink) and halftone drawings (wash, oil or crayon dust). Lead pencil drawings do not lend themselves readily to the photoengraving process and therefore are not considered as finished drawings.

The black and white line drawing is the least costly, the black and white halftone drawing considerably more costly, while the color drawing is almost prohibitive in cost for reproduction in a scientific paper. The kind of drawing that best fulfills the need should be selected to illustrate a point of emphasis. The simple line drawing often fulfills this need far better than the most elaborate drawing. It would seem then that the author should be familiar, at least superficially, with the processes involved in the preparation and the reproduction of an illustration. Only then can he chose his illustrations intelligently. He may never lift a pen or a brush but he will understand the problems of the illustrator and much time and expense will be saved.

The black and white line drawing is the most simple to reproduce but by no means the most simple to prepare if an elaborate drawing with a full range of tone values is required. If the author is not adept at pen and ink technic he had better not attempt it. Charts, graphs and line drawings with simple shading can be made by the author if no medical illustrator is available. With patience and a few simple rules to follow, a creditable drawing can be produced. A pencil sketch should be made first so that changes can be made in case of error or alteration, but pencil drawings should never be submitted as finished drawings. Bristol 2 ply or 3 ply drawing paper is used for line drawings with a crow quill pen and black water proof India ink to make the finished drawing. Colored or fountain pen inks should not be used as they do not reproduce well. For charts, graphs and the like, be provided with a T square, drawing instruments, triangles and curves. For purely mechanical drawings a ruling pen must be used to insure uniform thickness of line.

When a more elaporate line drawing is to be made, the technic is not so simple. Scratch board, a chalk coated, smooth surfaced paper, is used to render the finished drawing. The advantage of this is that it aids in achieving many tone combinations. For example, structural details may be shown within deep shadows by painting in the shadows in solid black ink. After the ink has dried the details may be scratched out with an engraving tool or a razor blade. Highlights also may be scratched out on the drawing. Joseph Gillot's crow quill pen and No. 1000 pen are used so that both rigid and flexible lines may be made.

A preliminary sketch is made on sketching paper with a Wolff's carbon pencil, grade HB or B. The points must be kept sharp at all times so it is a good plan to have a number of pencils at hand. The sketch is corrected and elaborated until it is ready for the final drawing. It is then placed face down on another sheet of sketch paper and the back is rubbed briskly with a knife handle. This transfers the image in reverse to the second sheet. The reverse image is then transferred to the scratch board in like manner. In so far as is possible the pencil lines in the sketch must be drawn as accurately as they will appear in the final drawing. It is far easier to draw in the ink lines with the proper spacing between them and to maintain their general direction if one has guide lines to follow. Only the most facile draughtsman can improvise his technic as he proceeds.

In addition to an outline there must be a variety

Assistant Professor of Medical Illustration and Director of the Section, St. Louis University School of Medicine.

of lines to express form and texture. This is particularly true when an internal organ must be depicted within a cavity (fig. 1). In drawing the uterus and its ligaments within the peritoneal cavity one has many contours and forms to express. Here it is necessary to use a flexible pen such as No. 1000. When attempting to represent a cavity one must exert pressure on the pen to give a wider

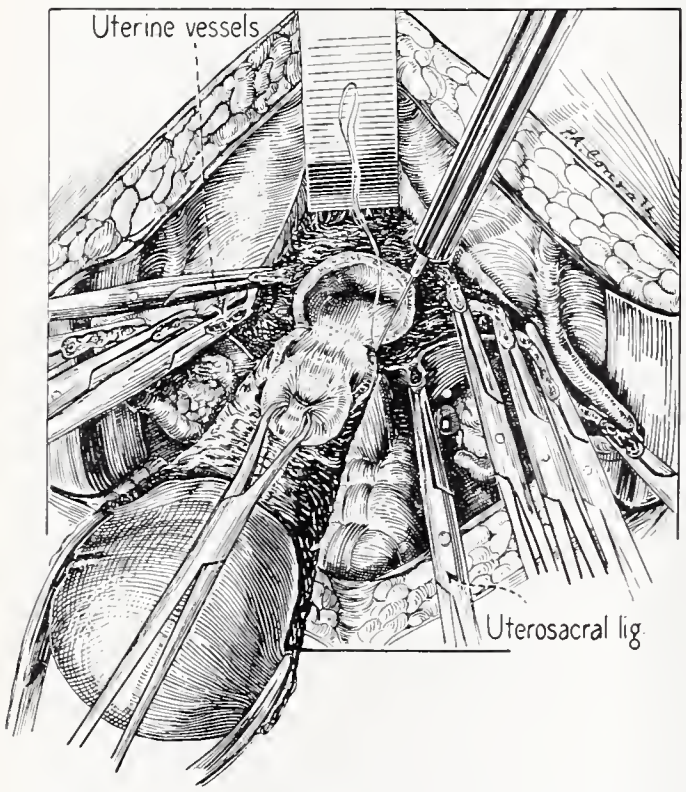


Fig. 1. Illustrating pen and ink technic. Note scratch out detail in the raw surface of the uterus and in the pelvic floor.

line and depict shadow. As one emerges from the cavity to follow the rising form of the uterus the pressure is gradually relaxed until the highest convexity is reached. Here the line is quite thin, fading away into the high light reflection. With this modeling in mind the succeeding lines are drawn in parallel to and evenly spaced from the preceding lines except where expression of form variation demands that the spacing become wider. Sometimes it is difficult to express form completely in this manner, therefore crosshatching is resorted to. However, it must be sparingly used. A course of practice in drawing various types of lines is time well spent.

To reproduce a line drawing it must be photographed first. A glass plate is coated with collodion with potassium bromide and potassium iodide in suspension within in. The plate is covered with silver nitrate and exposed while wet. After development and fixation the plate is dried, the negative is stripped from the glass and placed on a second glass plate in reverse. This is done so that when the negative is printed on a sensitized metal plate it will be properly oriented.

A zinc or a copper plate is coated with a colloid solution sensitized with ammonium bichromate. The negative is placed in contact with the sensitized plate and the exposure is made. Those portions of the plate that the light reaches become insoluble when bathed in warm water. The unexposed portions are washed away leaving an image in relief on the metal plate. The plate is then etched with the insoluble portions acting as a resist to the etching acid. Etching takes place downwards and laterally. Therefore, to keep the relief image from being undermined, a red, resinous powder called dragon's blood is brushed over the surface of the plate. The rough edges around the image catch the powder which is burnt in over a gas flame creating an acid resisting enamel. After a further course of etching, the acid resisting enamel is removed with a suitable solvent leaving a metal image in relief on the plate. The plate is finished and cleaned and mounted on a wooden block to give it type height.

The preparation and reproduction of a halftone drawing require different technics. The crayon dust halftone technic is widely used by medical illustrators. It was devised by the late Max Brödel of Johns Hopkins University School of Medicine. A black and white water color wash technic is used and taught by Tom Jones, Professor of Medical Illustration, at Illinois University School of Medicine. A special chalk coated rough finish paper called Ross board No. 00 is used for making a crayon dust drawing. The chalk coating is stippled with tiny raised dots impressed into the chalk during the manufacturing process. This gives the paper a tooth which catches the crayon dust when applied with a brush. The dust is called Conte Crayon Sauce which, along with Wolff's carbon pencils, Conte crayon pencils, soft rubber erasers, cork stomps, chamois cloth and engraving tools are the materials used to render the drawing.

A rough sketch is made on sketch paper with a Wolff's carbon pencil. It is corrected, transferred and retransferred to the Ross board. The crayon sauce is applied to the image with flat or round sable brushes. For large surfaces large brushes are used while a series of small brushes apply the detail. These are blended with the chamois cloth, the black accents being applied with the Conte pencil. The softer highlights are lifted out with the eraser and the brilliant high light accents are scratched out with an engraving tool (fig. 2). After the drawing is completed it is sprayed with a solution of shellac and alcohol. It is then mounted on a stiff board and covered with a flap. A halftone drawing must have all the tone gradations and variations from white through the grays to black with correct contrast to give it the naturalistic look required of medical illustrations.

Halftone drawings and photographs are reproduced in the same manner. All of the gradations and tone variations must be duplicated. However, it must be remembered that printer's ink is an opaque pigment capable of impressing only one continuous tone, black, upon paper. With line draw-

ings there is no difficulty since there are only two tones involved; namely, the white of the paper and the solid black lines of the drawing. In order to make a plate which will print all of the tone gradations of the picture, the surface of the plate must be broken up into groups of small dots concentrated in some areas and dissipated in others. The result will be a print made up of innumerable minute dots of solid ink impressed upon paper giving a halftone reproduction of the original.

This is accomplished by photographing the picture through a screen which is placed between the lens and the photographic plate. The screen consists of two plates of glass whose surfaces are etched with parallel lines at a 45 degree angle. The lines are filled with an opaque substance and the plates are then cemented together so that the lines cross at right angles. The distance between the lines varies with the type of screen used. The screens are numbered according to the number of lines to the inch length. Thus there are 60 line, 80 line, 100 line and even 400 line screens. These variations are necessary because of the many kinds of paper used. For newsprint, an absorbent paper, a coarse screen is necessary to keep the dots from running together. For less absorbent papers finer screens are used.

As the light filters through the screen to the photographic plate the lines manifest themselves on the developed negative as a series of dots. The size of the dots varies according to the screen number and to the amount of light reflected from the various portions of the picture to the plate. In the deep shadows the dots will run together while in the light portions the dots will be widely spaced. The negative is developed, fixed, dried, stripped, reversed and printed on a sensitized metal plate as in line process of photoengraving. However, the halftone screen method is more complicated. The etching takes place in a series of bites. The plate receives the particular attention of a number of specialists in certain phases of engraving so that the fine detail so necessary in medical illustrations can be brought out. This fine work requires a copper plate which, with the additional labor time, makes it considerably more costly.

The reproduction of a full color drawing goes through the same processes as the black and white halftone, only in this case three, four or more plates must be made. This means a color separation negative for each of the three primary colors and one black and white negative if the four color process is used. Four screened copper plates must be made and the angulation of the screen on each plate must vary so that when the plates are printed they will not register identically, otherwise the illusion of color will not occur. One can readily see that the multiplication of labor and materials by four prohibits the use generally of color work by other than commercial publications.

There is one other method of reproduction well adapted to medical illustration. This is the Ben Day process of mechanical shading. If the author wishes to combine gray tints with a line drawing he may do so without resorting to the tedious insertion of dots or lines by hand. The drawing is prepared in the usual way but the shaded parts are left blank. The tints are mechanically put in by the engraver. The Ben Day process includes many tints such as vertical, horizontal, curved or cross hatched lines as well as patterns of dots. These patterns all have numbers and are flexible plates of gelatin or plastic. The illustrator places a translucent paper cover or flap over the line drawing and outlines on the flap those portions to be tinted with the corresponding numbers within the outlines. The engraver does the rest. The drawing is put into a frame and those portions not to be tinted are masked out with frisket paper or some other method. The gelatin plate is inked and placed in contact with the drawing. Using the ruler, the engraver passes over the plate, printing the tint on the drawing. The tint may also be put on the negative or on the plate. The result is a crisp line with an even gray tint.



Fig. 2. Crayon dust technic of craniotomy.

In conclusion, it is recommended that the author not only select his illustrations with care, but that he be guided by the journal to which he submits his paper, when he choses his drawing technic. This decides whether or not he will use halftone or line drawings. All journals reproduce line drawings well whether they use enameled paper or not. For obvious reasons most of them prefer to do so; moreover, the number of illustrations will not be limited if he uses line drawings.

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1. Kelly, Howard A.: The Vermiform Appendix and Its Diseases, W. B. Saunders Company, 1905.

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1. Douglas, R. G.; Ball, T. L., and Davis, I. F.: California Med. *73*:463 (Dec.) 1950.
2. Pratt, P. T.: Nebraska State M. J. *35*:294 (Sept.) 1950.

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PRESIDENT'S PAGE

I have just returned from the Civilian Defense Conference in Washington, D. C. The conference was called by the administrator, former Governor Millard Caldwell, of Florida, to explain the Federal Civilian Defense Program and to enlist the support of the American people to awaken the entire nation from its apathy to the necessity for Civilian Defense. The conference left little doubt as to the importance of organized defense of the civilian population. We were again reminded that war was no longer just between armies but the enemy would undoubtedly attempt to break our will to resist by bombing our civilian population and industrial plants, and that no one would be immune to such an attack. It is hoped that the war will not spread and that no bombs will ever be dropped on America but we are fighting countries obsessed with an unscrupulous ideology that would stop at nothing to enslave the world.

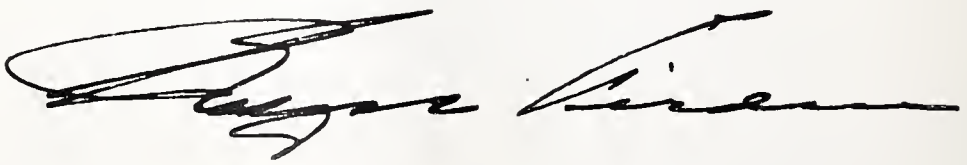


It is conceded that no military defense, however good it may be, could stop all enemy planes from reaching their targets and that the casualties from just one successful raid might exceed our total losses in the last war. Civilian defense cannot stop bombs from falling but a properly trained civilian population, it is estimated, can reduce the casualties at least 50 per cent. Trained people with definite jobs to do will prevent panic and chaos which could cause defeat as quickly as reverses in actual fighting. If the war should spread, and no one knows when it may, civilian defense in such a war this time would be of equal importance as the Armed Forces.

The Federal Civilian Defense Administration realizes the stupendous task ahead, and quite frankly admits that they do not have any appropriation to finance the job. which, if entirely controlled by the federal government, would cost additional billions in taxes with another gigantic bureaucracy to support. Hence the appeal is being made to organize the entire country on a volunteer basis—some millions of us, in fact, in towns, cities, counties and states all over the country.

These remarks are not made in disparagement of the plans which have been made, and our own men, principally Drs. Carroll Hungate, William Shaw, Curtis Lohr, and Health Commissioner Buford Hamilton deserve the highest praise, but their plans are of no avail if they are not carried through. They have the plans—they must now be implemented!

We American people are having a lot of trouble getting used to the idea that this is necessary—we all hope it is not! We blow hot and then cold as our fortunes in the Korean war fluctuate. In any event we cannot afford to be unprepared. The hazard and the price of defeat is far too great. We must push our plans and training for defense rapidly to completion. It is everyone's job for our own sake and our neighbor's. We have the choice now of being volunteers or of having to support another huge and expensive federal bureau. It is up to us—and no one knows how late it is!



Editorials

J. WILLIAM THOMPSON, M.D., PRESIDENT-ELECT

J. William Thompson, M.D., St. Louis, was elected President-Elect of the Missouri State Medical Association at the 93rd Annual Session held in Kansas City, April 22 to 25, 1951. He will serve as President-Elect until the next Annual Session when he will be installed as President.

Dr. Thompson has been active in medicine in Missouri since 1928 when he transferred to the St. Louis Medical Society from Rochester, Minnesota. He brings to his new office much ability and experience in medical organization work.



J. W. THOMPSON, M.D.

Born in Cambridge, Ohio, on November 30, 1898, Dr. Thompson moved with his family to Granite City, Illinois, where he attended grade and high school, graduating from high school in 1917.

His college work was completed at Washington University, St. Louis, and he received his medical degree from Washington University School of Medicine in 1923. After an internship at St. Luke's Hospital, he was accepted on a surgical fellowship at the Mayo Foundation, Rochester, Minnesota, where he was first assistant to Waltman Walters, M.D., head of a surgical section, and also worked with both William J., and Charles H. Mayo.

He returned to St. Louis in 1928 becoming surgeon for the Soper-Mills Clinic. In 1936 he entered the private practice of surgery. He is at present consultant surgeon at the St. Louis City Hospital and chief of the surgical section of De Paul Hospital. He became interested in medical economics and was chairman of the first Committee on Medical Economics of the St. Louis Medical Society, the committee whose work eventually led to the establishment of Blue Cross and later Blue Shield.

In the St. Louis Medical Society, he served on the Council for three years prior to his Presidency of St. Louis Medical Society in 1949. He was re-elected to the Council and still serves in that capacity. He became Councilor of the Third Councilor District of the Missouri State Medical Association in 1944 and has served as Chairman of the Council since 1946.

Dr. Thompson is a fellow of the American College of Surgeons, the International College of Surgeons, is a diplomate of the American Board of Surgery, member of the Western Surgical Association, the American Association for Surgery of Trauma, the Southwestern Surgical Congress, the American Association for the Advancement of Science, American Public Health Association, Residents and Ex-Resident Physicians of the Mayo Clinic and the St. Louis Surgical Society. He is a member of the Alpha Omega Alpha, Sigma Xi and Tau Pi Epsilon honorary fraternities. Dr. Thompson has published approximately thirty medical articles, dealing mainly with subjects related to abdominal surgery, particularly gastrointestinal cancer. The first honor on scientific exhibits at the 1948 annual session was awarded the exhibit, "Surgical Pathology of the Intestinal Tract," co-sponsored by Dr. Thompson. He is a member of the Missouri Athletic Club and the Algonquin Country Club. His hobbies are photography, oil painting and golf.

Dr. Thompson was married to Marjorie Hyslop of Fulda, Minnesota, in June, 1927. Their only child, J. William Thompson, is a student in St. Louis University School of Medicine.

The Association has chosen well for its President-Elect for 1951 and President for 1952.

ANNUAL SESSION

The Ninety-third Annual Session of the Missouri State Medical Association closed with a session of the Council on April 25 at the Municipal Auditorium, Kansas City. Total attendance at the session was approximately 1,210 with 718 Doctors of Medicine registered. Others who attended were interns and residents, technicians, nurses, medical students and exhibitors.

Officers of the Association elected were: President-Elect, J. W. Thompson, M.D., St. Louis; Vice Presidents, Otto W. Koch, M.D., Clayton; A. P. Rowlette, M.D., Moberly, and Rollin H. Smith, M.D., West Plains; Secretary, H. E. Petersen, M.D., St. Joseph; Treasurer, C. E. Hyndman, M.D., St.

Louis; Speaker of the House, F. T. H'Doubler, M.D., Springfield, and Vice Speaker, Victor E. Scherman, M.D., St. Louis; Editor, R. O. Muether, M. D., St. Louis; Associate Editor, V. T. Williams, M.D., Kansas City. R. E. Schlueter, M.D., St. Louis, and James R. McVay, M.D., Kansas City, were reelected Delegates to the American Medical Association, with F. G. Pernoud, M.D., St. Louis, and R. B. Wray, M.D., Nevada, alternates.

C. Edgar Virden, M.D., Kansas City, was installed as President at the Banquet in Honor of Past Presidents. W. A. Bloom, M.D., Fayette, presided as President at the banquet, which filled the Ballroom of Hotel President. Melvin A. Casberg, M.D., St. Louis, Dean of St. Louis University School of Medicine, spoke on "The United States and the Far East."

The color television portion of the scientific program was well attended and was judged by many as one of the best handled medical television programs that has been presented anywhere in this country. Smith, Kline and French Laboratories sponsored this part of the program and Ralph R. Coffey, M.D., Kansas City, was in charge of arranging the television presentations. The formal portion of the program, composed of presentations by out of state speakers, in the main, was of a practical nature and each talk was well attended. Victor B. Buhler, M.D., Kansas City, was chairman of the Committee on Scientific and Postgraduate Work, which had charge of all scientific presentations.

Awards for scientific exhibits went to C. Stewart Gillmor, M.D., Kansas City, for his exhibit on "Common Rheumatic Diseases"; Harry M. Gilkey, M.D., Kansas City, "Practical Points in Diagnosis and Treatment of Children's Diseases"; Fred B. Campbell, M.D., Kansas City, "Rectal Diseases." Awards for technical exhibits were to Dumas-Wilson & Co., St. Louis; Eli Lilly & Company, Indianapolis, and A. H. Robins Co., Richmond, Virginia.

The House of Delegates met on the first day of the session, with a recessed session on the following day and the final meeting on the last afternoon. Some of the work of the House included the approval for application for an amended charter for the Association; the acceptance of a proposed Constitution to lay on the table for one year, and the adoption of several amendments to the By-laws which were for the purpose of clarification.

A recommendation of the Council, based on the 1950 audit of the Association's accounts, that an assessment of $10.00 be placed on each member, retroactive to January 1, 1951, was passed by the House.

A resolution approving a metropolitan area for a four year medical school of the University of Missouri was adopted by the House.

A resolution that an office of the Association be placed in Jefferson City resulted in a recommendation by a reference committee that a committee study this recurring question and report to the Council within six months and that the report then be published in The Journal. The recommendation was adopted.

Boys Town of Missouri, St. James, was approved by resolution and physicians were urged to cooperate by giving medical aid and examinations to candidates in their own communities.

The Committee on Infant Care presented a resolution to not approve a program of emergency maternal and infant care by the government at the present time, which was adopted by the House.

A request from the American Medical Association Educational Foundation for approval and support was presented and approved by the House.

The work of the Community Health League was approved and members were urged to support this work financially.

The problem of the Board of Medical Examiners in inability to do investigational or follow-up work because of lack of finances was presented and the House of Delegates recommended that attempt be made to obtain legislation that would increase the biannual registration fee, the examination fee and the reciprocity registration fee.

St. Louis was selected as the place for the 1952 Annual Session, which will be held March 30 through April 2, 1952.

Minutes of the Session will appear in the July issue of The Journal.

MISSOURI HEALTH COUNCIL

Basil O'Connor, New York City, President of the National Foundation for Infantile Paralysis, speaking before the third annual state wide Health Conference, sponsored by the Missouri Health Council in Jefferson City on May 9, stated that the world today lacks, as much as anything else, health. He said health needs to include, in its connotation, not only physical well-being but a spiritual feeling of the individual's proper relationship to God and man. He explained that there is the greatest opportunity in the world today for groups, as represented by those who were present, to make the greatest contribution to health and social welfare activities ever made. Many local and state health councils, which are serving to effect cooperative and coordinated action on the part of voluntary and official health organizations and agencies, are producing splendid results, he said.

In this respect the Missouri Health Council is rated as one of the top five of the state health councils in the United States, Mr. O'Connor told the three hundred people attending the conference.

Today, health is everyone's business, said Dr. C. Edgar Virden, Kansas City, President, Missouri State Medical Association.

This annual state wide Health Conference serves both as a stimulus and information disseminator for the promotion of more effective means of solving local and state health problems.



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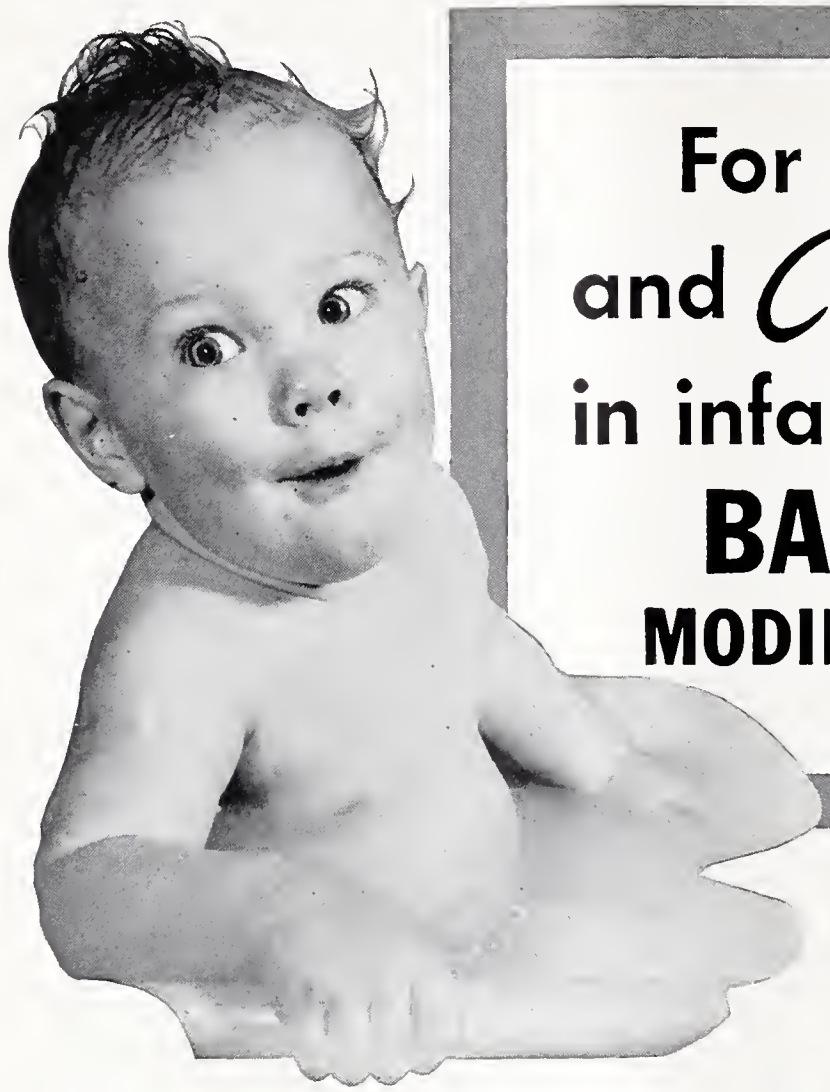
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Organization and Economics

NEWS

James H. O'Neil, M.D., Kansas City, spoke at the annual Creighton University Spring Medical Assembly at Omaha on April 19 on "Acute Cholecystitis and Intestinal Obstruction."

David Littauer, M.D., Kansas City, was elected first vice president of the Midwest Hospital Association on April 12.

E. F. Hoctor, M.D., Farmington, spoke at an open meeting sponsored by the Business and Professional Women's Club of Cape Girardeau on April 10. His subject was "Understanding Ourselves and Others."

Claude Duckett, M.D., Lamar, was elected Barton County Representative to the Missouri legislature in a special election on April 11.

William Q. Wu, M.D., Kansas City, spoke before the Lexington Rotary Club on April 11 on "The Origin of Neurosurgery."

J. L. Fisher, M.D., St. Joseph, spoke before a public meeting sponsored by the Woman's Auxiliary and nurses association at Maryville on April 11 on "Are We Helpless?"

Landon R. McIntire, M.D., St. Charles, spoke before the Lincoln School Parent-Teachers Association on April 12.

Paul A. Knepper, M.D., St. Joseph, spoke to the St. Joseph Kiwanis Club on April 12 on "The Blood Bank."

Sam Grantham, M.D., Joplin, spoke before the Joplin Junior College students on "Discoveries and New Methods in the Field of Medicine" on April 4.

J. J. Barber, M.D., Walnut Grove, was a guest of honor at "Dr. Barber Night" held by the Walnut Grove Lions Club on April 12 following his announcement of his retirement from medical practice.

S. W. Scorse, M.D., Joplin, spoke on "Psychomatic Medicine" at a meeting of the Fifth District Nurses Association at Joplin on April 10.

Richard B. Schutz, M.D., Kansas City, spoke on "Balanced Estrogen Therapy by Minimal Dose Technic" at a tricity meeting of the Kansas City Obstetrical and Gynecological Society, the Chicago Gynecological Society and the St. Louis Gynecological Society at St. Louis on April 14. Drs. Willard Allen and Joseph A. Hardy, St. Louis, discussed the paper.

Harry B. Stauffer, M.D., Jefferson City; Winfred L. Post, M.D., Joplin; Ernest T. Rouse, M.D, and Theodore E. Walsh, M.D., St. Louis, were guest instructors at a postgraduate course in ophthalmology and otolaryngology held at the University of Kansas Medical Center at Kansas City, Kansas, April 16 to 20.

The General Practitioners Study Club International will hold its annual convention in Rome, Italy, September 12 to 15, 1951. Itinerary and information may be obtained from John O'Connell, M.D., 10300 Lackland Road, St. Louis County 14.

Horace W. Carle, St. Joseph, was installed as president of the Missouri Heart Association at a meeting on April 22.

C. E. Carlton, M.D., Stoutland, was honored by a community meeting in the Stoutland High School auditorium on April 30 commemorating his fifty years in the practice of medicine.

Adolph G. Schlossstein, M. D., and William E. Sauer, M.D., St. Louis, were honored at a dinner meeting of the St. Louis City Hospital Alumni Association on April 13. Bronze plaques inscribed "For meritorious service and teaching house officers at St. Louis City Hospital" were presented to them. Robert J. Crossen, M.D., St. Louis, accepted the award for his father, the late Harry S. Crossen, M.D.

James R. McVay, M.D., Kansas City, has been named on a committee of the American Medical Association appointed at the request of Senator Herbert H. Lehman to meet with the subcommittee on Health of the Committee on Labor and Public Welfare in Washington for discussion of problems on the committee's agenda.

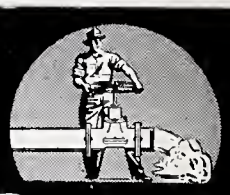
MUSINGS OF THE FIELD SECRETARY

A good deal of thought and preparation on the part of those directly concerned with putting on the scientific television programs during the Annual Session last month in Kansas City was quite evident as judged by the quality of the presentations. Another bit of equally important evidence was the nearly perfect timing of the demonstrations.

On May 9, some three hundred Missourians attended the third annual state-wide Health Conference in Jefferson City which was sponsored by the Missouri Health Council.

Dedication services for the new Dunklin County Memorial Hospital at Kennet were held Sunday afternoon, May 13.

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From The Literature

- Bubert and Cook, Bulletin of School of Medicine, Univ. of Maryland, Vol. 32, pp. 175-190, 1948.
- Paul and Montgomery, J. Iowa State Med. Soc., June, 1948.
- Krantz, Holbert, Iwamoto and Carr, J.A.Ph.A., Vol. 36, pp. 248-250, 1947.
- New and Non-official Remedies, 1950, p. 285.

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Perry County Memorial Hospital

PERRY COUNTY MEMORIAL HOSPITAL

The Perry County Memorial Hospital, Perryville, opened officially at 9:00 a.m. on April 16. This is the second hospital to be opened in Missouri, built under the provisions of the federal Hill-Burton Act.

For the construction of this hospital, the voters of Perry County passed a bond issue for $250,000 in 1946. With this and federal funds amounting to $125,000, the fifty bed institution was in the making. Mounting construction and material costs called for approval of an additional $100,000 by the voters in 1948 and in 1949 they added $60,000, increasing the bond obligation to $410,000. The total cost of the building and equipment amounts to some $615,000 of which $195,000 was provided by the federal government and $10,000 by the state.

At the end of the first two weeks of operation, admissions at the hospital had passed the one hundred mark.

This splendid facility for aid in saving lives and alleviating illness presents another milestone on the road to better health in rural Missouri.

MISSOURI STATE MEDICAL SECRETARIES AND ASSISTANTS SOCIETY

The Missouri State Medical Secretaries and Assistants Society was organized at a meeting in Kansas City on April 22 with twenty-five members. The purposes of the organization are promotion of higher standards of efficiency, education and fellowship. Officers of the society are: President, Miss Marie Oates, Kansas City; first vice president, Mrs. Nita Fabac, Kansas City; second vice-president, Miss Amy Shock, Jefferson City; recording secretary, Mrs. Mary K. Shell, Fayette; corresponding secretary, Miss Alta Bingham, Kansas City; treasurer, Miss Jean Garrett, Kansas City.

Eligibility for membership requires one year of full time work for a physician who is a member of the Missouri State Medical Association. Junior membership is open to anyone employed full time by such a physician.

The society, sponsored by the Jackson County Medical Secretaries and Assistants Club, which was formed in 1938, will hold its next meeting in Fayette on June 10 as a luncheon meeting.

MEMBERSHIP AND FELLOWSHIP CARDS

The following is reprinted from the *Journal of the American Medical Association*, May 12, 1951: "Every effort is being made to see that all 1951 A.M.A. membership cards are in the hands of members in time for the annual session in Atlantic City, N. J., June 11-15. Fellowship cards may not reach Fellows in time for the Atlantic City session because of additional clerical work involved in checking membership dues received. However, a special arrangement will be made at the annual session registration desk for Fellows who have sent in fellowship dues but who have not yet received pocket cards. Such physicians may apply at windows reserved for Fellows. Clerks will have an up-to-date listing of Fellows and will be able to complete registration even without fellowship cards. Both members and Fellows who wish to speed up registration at the annual session may write to the American Medical Association for an advance registration form."

Deaths

Ginsberg, Edward L., M. D., Kansas City, a graduate of the Kansas City Medical College, 1903, honor member of the Jackson County Medical Society; retired; aged 73; died March 11.

Puckett, Charles L., M. D., St. Louis, a graduate of St. Louis College of Physicians and Surgeons, 1904; member of the St. Louis Medical Society; aged 73; died March 30.

Horigan, Joseph A., M. D., Kansas City, a graduate of the George Washington University School of Medicine, 1888; honor member of the Jackson County Medical Society; aged 87; died April 1.

Brown, Thomas K., M. D., St. Louis, a graduate of Washington University School of Medicine, 1924; Fellow of the American Medical Association; Assistant Professor of Clinical Obstetrics and Gynecology, Washington University School of Medicine; member of the St. Louis Medical Society; aged 53; died April 30.

SOCIETY PROCEEDINGS

SECOND COUNCILOR DISTRICT

W. F. FRANCKA, HANNIBAL, COUNCILOR

North Central Counties Medical Society

The North Central Counties Medical Society met at the Perry Cafe, Novinger, for dinner on April 12. The meeting was called to order in the office of Dr. J. S. Gashwiler. A business session was held.

Trawick H. Stubbs, M.D., Columbia, Dean of the University of Missouri Medical School, spoke on "The Medical Education Program in the State of Missouri."

Those in attendance were Drs. Val E. Miltenberger, S. L. Freeman, C. E. Henry, J. B. Jones, Kirksville; J. S. Gashwiler, Novinger; Warner Herington, Green City; W. J. Stewart and C. R. Bruner and Trawick H. Stubbs, Columbia.

J. B. Jones, M.D., Secretary.

TENTH COUNCILOR DISTRICT

FRANK W. HALL, CAPE GIRARDEAU, COUNCILOR

Mineral Area County Medical Society

The Mineral Area County Medical Society met at State Hospital No. 4, Farmington, April 26.

Francis J. Burns, M.D., St. Louis, gave a valuable discussion on the diagnosis and treatment of rectal diseases, presenting numerous slides.

The business meeting followed.

Members attending were: Drs. C. G. Appleberry, Dailey Appleberry, F. R. Crouch, M. T. Haw, H. M. Roebber, Van W. Taylor and James J. Stout.

The Woman's Auxiliary met for their annual luncheon meeting at the home of Mrs. James J. Stout.

James J. Stout, M.D., Secretary.

BOOK REVIEW

Quinidine in Disorders of the Heart by Harry Gold, M.D., Professor of Clinical Pharmacology at Cornell University Medical College, Attending-in-Charge of the Cardiovascular Research Unit at the Beth Israel Hospital, Attending Cardiologist at the Hospital for Joint Diseases, Managing Editor of the Cornell Conferences on Therapy. Paul B. Hoeber, Inc., New York. 1950. Price $2.00.

This is a book dealing with all aspects of quinidine therapy including pharmacologic and clinical fields. The first chapters deal with actions, indications, effects on the electrocardiogram, blood levels and dosage. Each arrythmia is discussed in detail; also the use of quinidine in coronary thrombosis and in anesthesia and surgery. One chapter is devoted to the important subject of the combined use of quinidine and digitalis. All chapters are concise but complete and stress the mechanism of quinidine actions, both therapeutic and toxic. The bibliography, arranged chronologically, covers the literature of the subject since 1906.

This is an excellent monograph and should be of value to students, internists and cardiologists. R.V.P.



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Surgery of Colon & Rectum, One Week, starting September 17, October 15.
Esophageal Surgery, One Week, starting October 15.
Thoracic Surgery, One Week, starting October 8.
Gallbladder Surgery, Ten Hours, starting October 22.
Breast & Thyroid Surgery, One Week, starting October 1.
Fractures & Traumatic Surgery, Two Weeks, starting October 8.
GYNECOLOGY—Intensive Course, Two Weeks, starting September 24, October 22.
Vaginal Approach to Pelvic Surgery, One Week, starting September 17, November 5.
OBSTETRICS—Intensive Course, Two Weeks, starting September 10, November 5.
MEDICINE—Intensive General Course, Two Weeks, starting October 1.
Gastroenterology, Two Weeks, starting October 15.
Gastroscopy, Two Weeks, starting July 16.
Electrocardiography & Heart Disease, Two Weeks, starting July 16.
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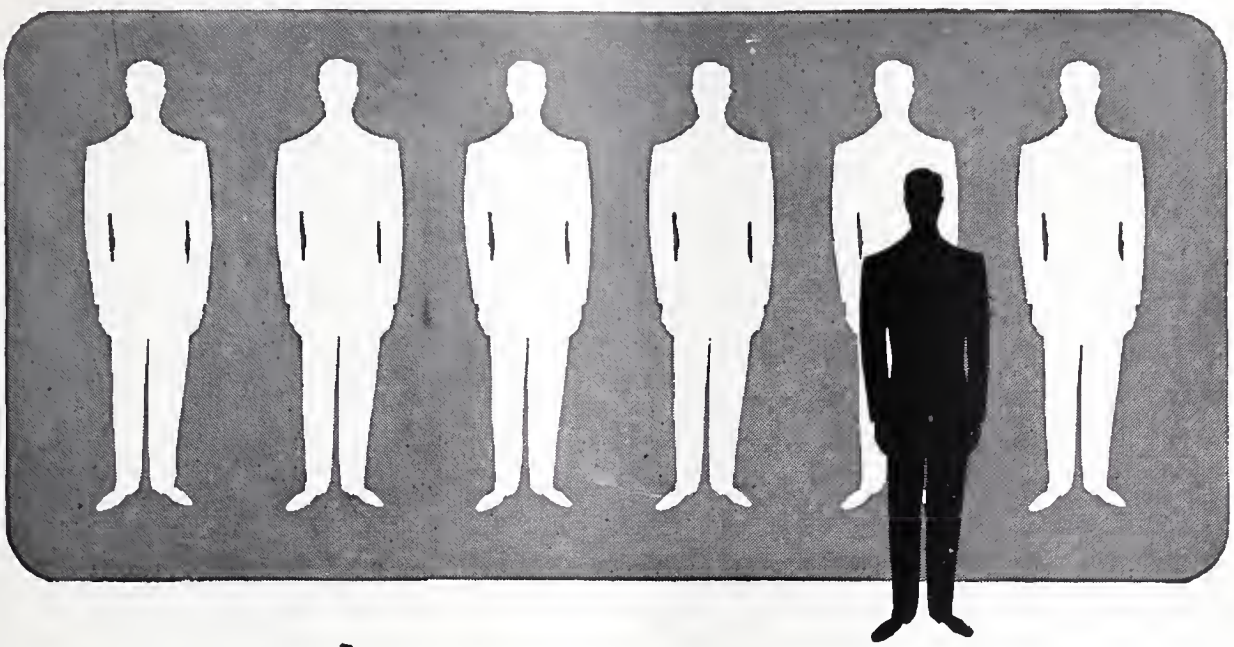
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1. Towse, R. C., Berberian, D. A., and Dennis, E. W.: *New York State Jour. Med.*, 50:2035, Sept., 1950.
2. Berberian, D. A., Dennis, E. W., and Pipkin, C. A.: *Am. Jour. Trop. Med.*, 30:613, Sept., 1950.

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From where I sit
by Joe Marsh

The Cow That Can't "Run Dry"

Sandy Johnson showed me his Jersey cows last week. It was a warm day and they were all under the trees near a watering trough.

And darned if one cow wasn't pumping water into the trough! It's a fact—she'd raise the pump handle with her nose, and use her throat to push it down again.

"That's Mabel," Sandy explained. "Sometimes they drink that trough dry, and she's learned how to fill it again. But she doesn't know her own strength—turns the place into a swamp if we don't watch her."

From where I sit, Mabel isn't the only one who doesn't know where to stop. For instance, people who carry their ideas too far—like those who would tell a man how to practice his profession . . . like those who would tell their neighbors what beverage to choose. I prefer a glass of beer with my meals. I know that a lot of other people prefer milk. But nobody ought to insist on "herding" others to his way of thinking.

Joe Marsh

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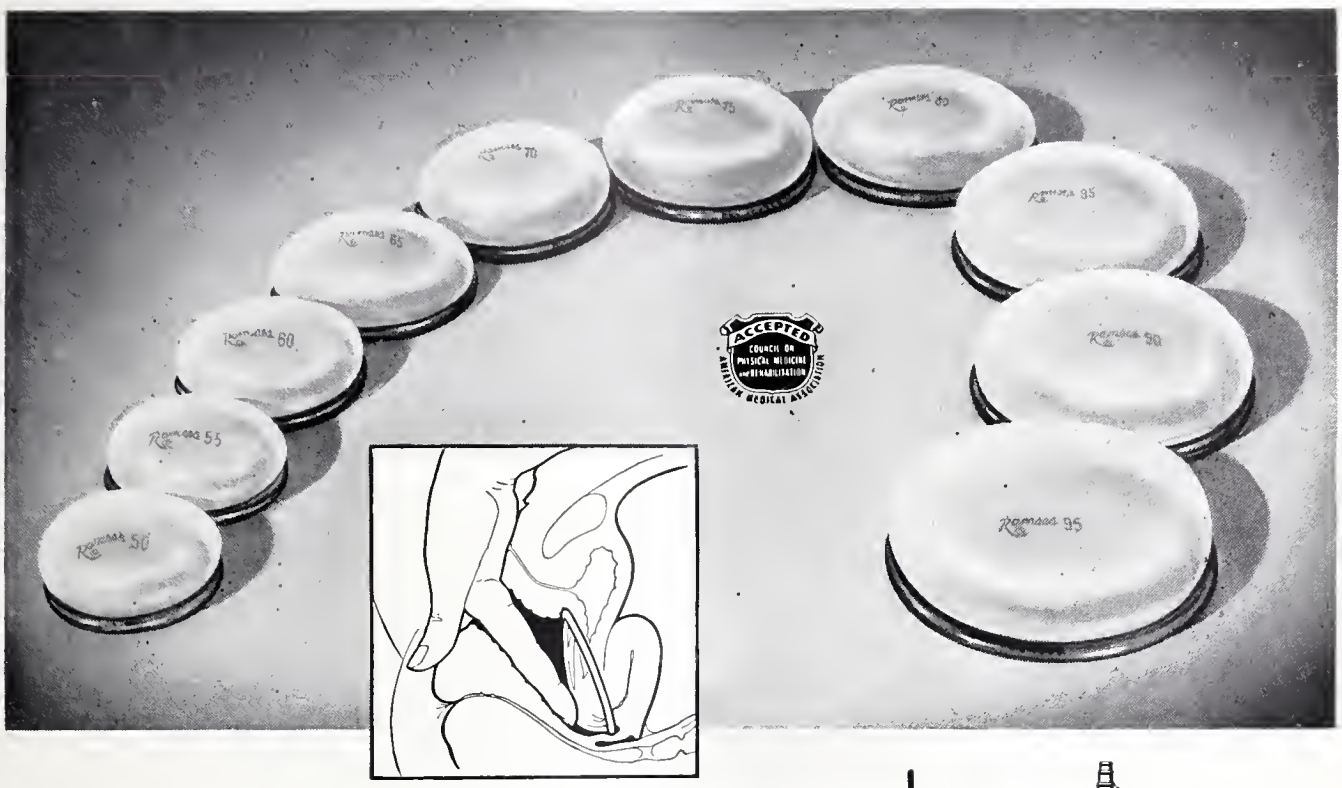
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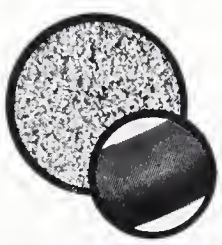
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1. Clark, Le M.: The Vaginal Diaphragm. St. Louis, C. V. Mosby Company, 1938; p. 43.
2. Dickinsan, R. L.: Techniques of Conception Control. Baltimore, Williams & Wilkins Campony, 1950; p. 17.



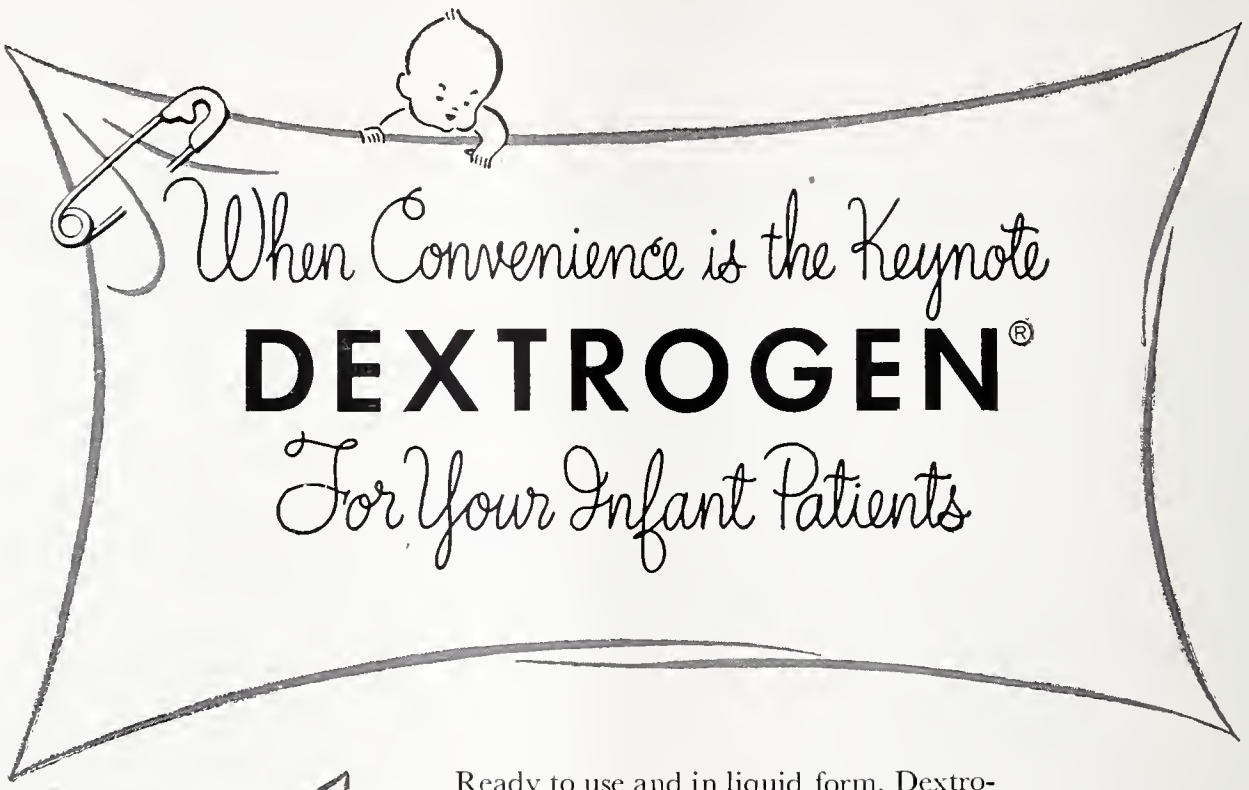


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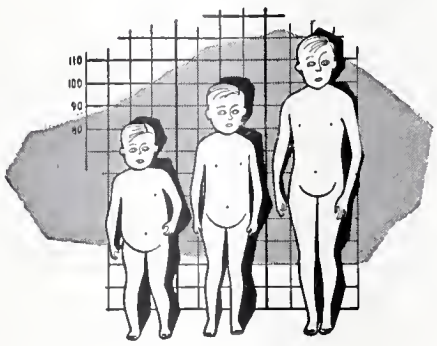
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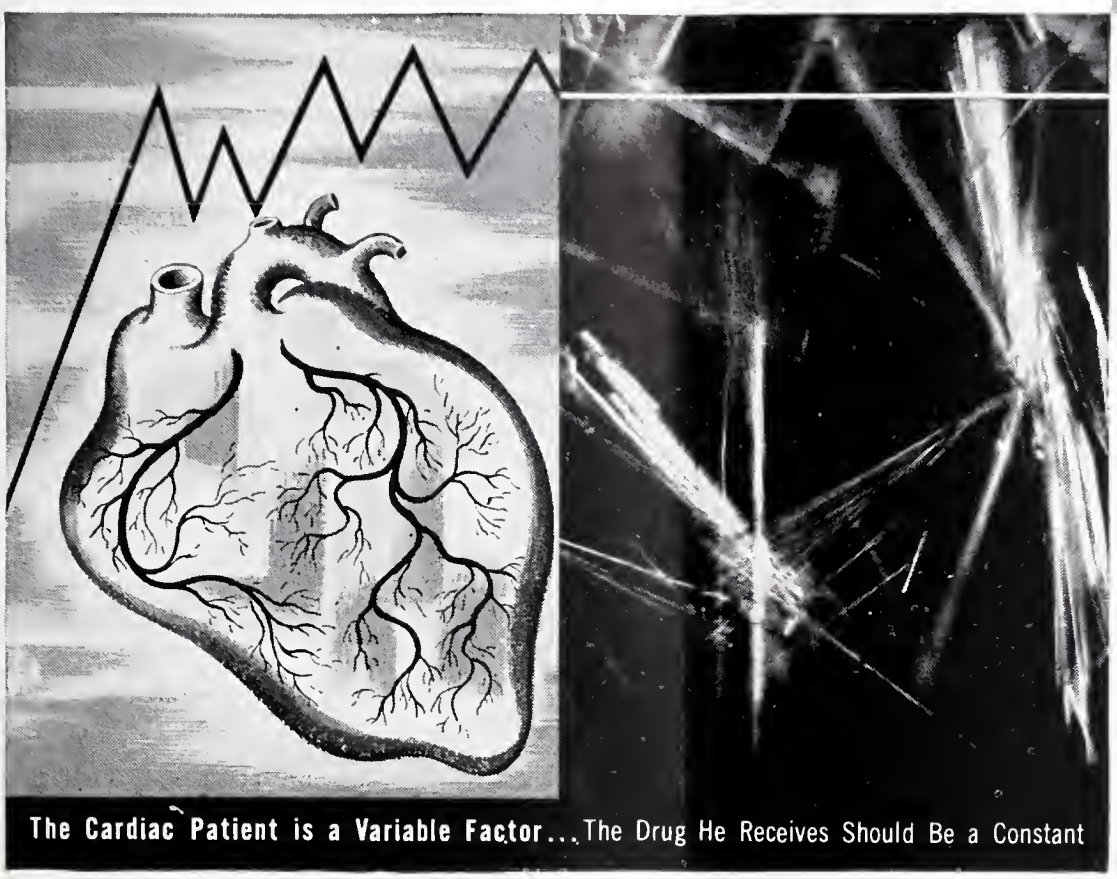
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In particular, meat offers distinct advantages in maintaining the nutritional status and vigor of the colitis patient. Meat furnishes an abundance of protein, B complex vitamins and iron. Its protein contains all the indispensable amino acids in biologic proportions for growth and repair of tissues. Its B vitamins include thiamine, riboflavin, pyridoxine, niacin, and the recently discovered B_{12}. Being almost completely digestible, meat yields negligible intestinal residues which are non-irritating and non-stimulating to the intestinal musculature.

Another feature of meat in the diet of the patient with ulcerative colitis is its appetite-stimulating value for overcoming anorexia and promoting the digestive processes. In a widely used low-residue colitis diet,[2] providing from 60 to 80 Gm. of protein, 120 Gm. of meat and 10 Gm. of crisp bacon are included.

---

1. Mann, G. V., and Stare, F. J.: Nutritional Needs in Illness and Disease, J.A.M.A. *142*:409 (Feb. 11) 1950.

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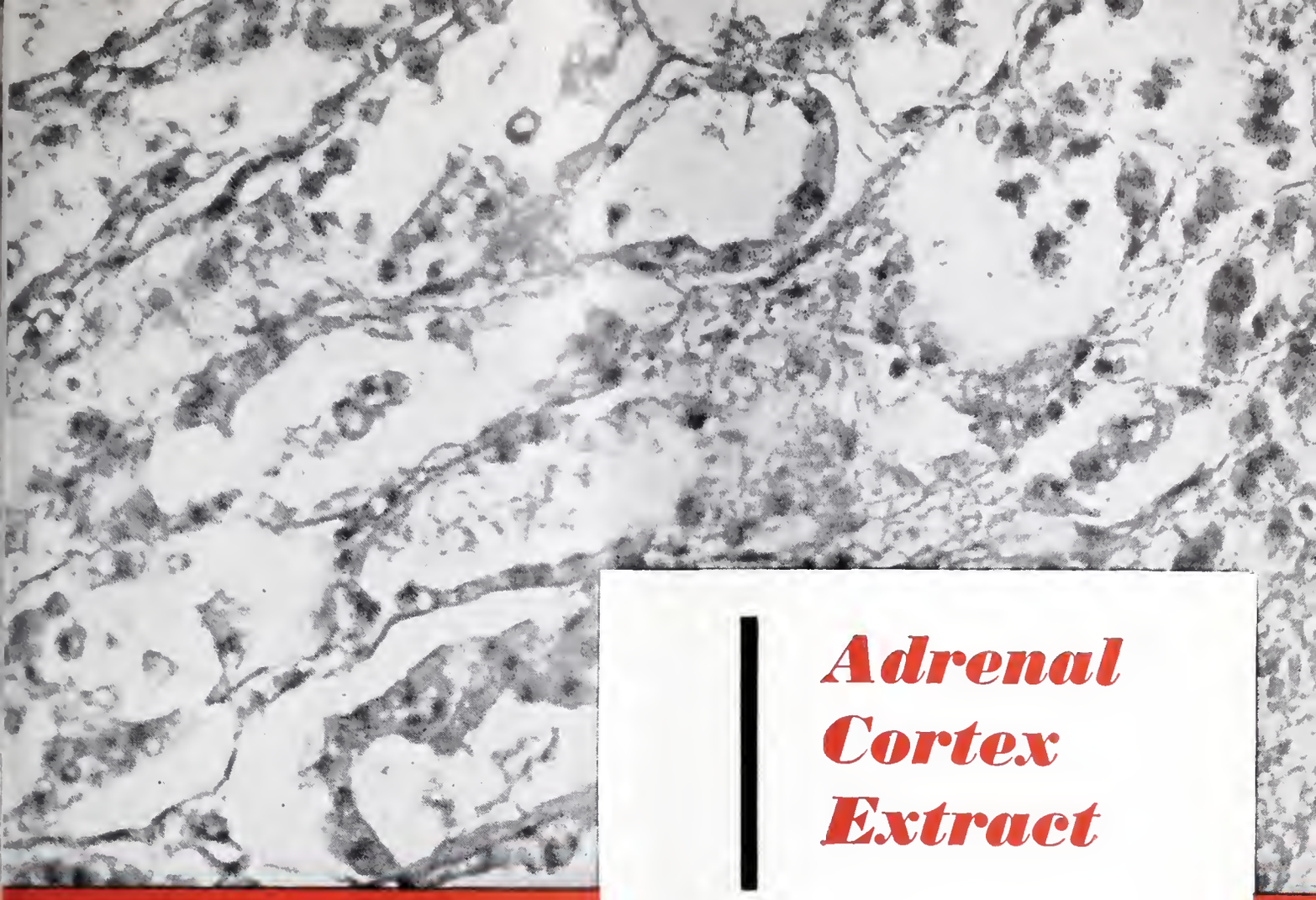
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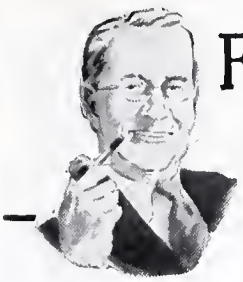
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From where I sit, a lot of us are sometimes overeager to "sound off" before we really understand what it's all about. Like those who would tell a man where and how he should practice his profession . . . like others who would deny their neighbors the right to a glass of beer now and then. It's a good idea to get a true picture of the situation before blasting out at anyone who "gets in the way" of our own pet ideas!

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Scientific Articles

SURGERY: THE PRACTICAL SOLUTION OF THE INGUINAL HERNIA PROBLEM OF INFANCY AND CHILDHOOD

CARL J. HEIFETZ, M.D.
ST. LOUIS

THE MANAGEMENT of inguinal hernia of infancy and childhood has posed problems which, in spite of much discussion in the literature, have not been solved. While recently there has been a trend to early surgery on these cases, there is often lacking enunciation of opinions on such important questions as: (1) Do inguinal hernias of infancy disappear spontaneously? (2) What benefit can be derived from the application of a truss? (3) When is surgery indicated? There have been compilations of opinions and statistics calculated to answer these questions. but these discussians have usually agreed that confusion exists. Since the pediatrician is greatly concerned with these problems, he will be interested in a surgical viewpoint derived from a study of the literature and from a rather wide personal experience over several years with the management of inguinal hernias of infancy and childhood. In place of the uncertainty derived from my readings and from my discussions with other surgeons and with pediatricians I have, finally, as the result of study and experience, simplified and standardized the management of these cases so as to assure my own composure and imperturbability.

I am not in agreement with the conservative statements made in some standard textbooks of pediatrics, e.g., "Hernias which persist through the second year of life should be repaired surgically."[1] ". . . many cases heal spontaneously during the course of the first year; others respond to simple mechanical measures, to some form of truss. Perhaps the majority of the cases persisting after the end of the second year will eventually come to operation."[2]

My own feeling is that, with few exceptions, inguinal hernias should be repaired as soon as the diagnosis is established. In the infant whose hernia is noted at birth operation should be delayed until several weeks of age, when one can feel assured that the baby does not present any feeding problems. Nutritional defects or the presence of other disease may constitute a contraindication to early operation. When cryptorchidism accompanies inguinal hernia, I have been inclined to delay surgery in order to give the testis a chance to descend spontaneously in later childhood. However, in the case of the three children in this series in whom the hernias were accompanied by undescended testes, I was forced to operate on two children (aged 8 months and 4 years, respectively) because of incarceration of the hernias. In the third child, aged 5 years, the presence of a troublesome irreducible hernia opposite the hernia associated with cryptorchidism led me to do a bilateral herniоplasty. While in all three of these children orchidopexy offered technical obstacles, I was able after careful dissection of the cord structures to bring the testes down into the scrotums without tension.

SPONTANEOUS "CURES"

The prevailing cross section of opinion is that a small percentage of inguinal hernias will cure spontaneously during the first year of life, and that an occasional cure can be expected even to the age of 2½ years. The term "cure" should be used in the sense that during the period of observation the hernia no longer protrudes. Failure to observe a protrusion does not necessarily mean a "cure" but, instead, may be due to the fact that the infant is almost always in a position of recumbency which favors reduction of the hernia, or that conditions at the time of observation do not favor herniation into the sac. Evidence points to the conclusion that true complete obliteration of the hernia sac after birth probably does not occur.[3, 4] Instead, the canal remains patent, waiting for conditions to become more favorable for refilling. These conditions include weakening of the surrounding musculature and increase in intra-abdominal pressure, and they may not arrive until years

From the Department of Surgery of the Jewish Hospital of St. Louis, St. Louis.

later. Cases of inguinal hernias of infancy and childhood have been written off as spontaneously cured, only to recur from two to twenty years later.[5] I witnessed such a case in a 6 months old female patient whose incarcerated inguinal hernia was easily visible and palpable. After slight taxis the hernia was readily reduced and remained undetectable without the application of a truss. Four years later the hernia recurred. Another significant recent case was that of a 14 year old boy, during whose orchidopexy a wide, patent funicular process down to the scrotum was found. The importance of this finding lies in the fact that though no protrusion into this sac was ever noticed, the funicular process did not close.

Several obstacles confront the investigator who tries to decide just what percentage of hernias "cure" spontaneously. When parents know their child has an abnormal condition, the impulse to do something about it and do it soon is almost automatic. The utmost persuasive skill to convince the parents to adopt a strictly observational program cannot compete over a period of months with the disappointment of seeing fruitless results, with the intercession of grandparents, the admonition of relatives and the counsel of friends. Trusses, homemade or sold by the truss maker, are sometimes employed without the knowledge of the investigator. In addition, in a mobile segment of the population (the parents belong to the young age group most prone to change residence, seeking change in economic and social status), many patients move beyond observational scope. Still others, dissatisfied with what they interpret as a "do nothing" attitude, seek and obtain different treatment elsewhere. Finally, it is questionable whether a lasting cure can ever be listed, for a large number of adults develop indirect inguinal hernias, considered by most authorities to be of congenital origin[6, 7, 8]; and while some actually give histories that they had hernias in infancy or childhood, others may have had momentary protrusions without their being recognized as hernias. For all these reasons I question the validity of statistics which seem to prove that hernias of infancy and childhood cure spontaneously and remain cured.

TRUSSES

The same obstacles that so prevent the compilation of accurate statistics on spontaneous cure of inguinal hernia apply even to a greater degree to the evaluation of the curative value of trusses. To reach correct conclusions it would be necessary to run equal and parallel series of hernia cases, those completely untreated and those whose hernias are completely and constantly kept reduced by trusses. The latter accomplishment frequently cannot be achieved.

The routine use of trusses for inguinal hernias of infancy and childhood has many drawbacks. There is a bewildering variety of trusses and belts from which to choose. The belt material may be metal, canvas, tape, cloth, muslin, rubber or linen, depending upon whether rigidity, flexibility or elasticity is desired. The occluding pads have been more variable in shape, size and construction. Some trusses have perineal straps, others do not. When such a variety of trusses have been employed to accomplish the task of keeping hernias reduced, it is clear that no one appliance is outstandingly successful. Even the yarn truss,[9, 10] which has been so widely popular because of its simplicity, falls far short of perfection. Perhaps its greatest defect is that the loop of yarn overlying the subcutaneous ring, i.e., the pad, actually becomes the narrowest part of the truss, whereas this is the precise area at which the truss should be widest. Some practitioners, grappling with this problem and being dissatisfied with available appliances, have designed what they considered to be more successful trusses, only to discard them later. I have personally questioned a well known surgeon who described such a truss a few years ago. He stated he had discontinued its use because it proved impractical; nevertheless, he has not withdrawn from the literature his original enthusiastic claims.

There are many reasons why trusses have proved unsatisfactory. It has been stated that adequate trussing should keep the hernia completely reduced for a period of from six to eighteen months.[11] A truss which accomplishes this on one patient may utterly fail on another, partly because of variations in size of the hernia, the subcutaneous ring and body configuration. Soilage from urine and feces add to the annoyance of the truss, frequently causing skin eruptions and excoriation. The proper application of a truss demands intelligent cooperation on the part of the mother. Besides learning how to apply it, she must learn just what constitutes reduction of the hernia, and must keep it reduced whenever the truss is removed for cleaning and bathing. It may take extraordinary agility to keep the hernia reduced in a crying, restless infant while the truss is removed, cleaned, dried and replaced. Sometimes an assistant is needed, or a duplicate truss must be in readiness. The attendant must be constantly vigilant for cleanliness, proper positioning of the appliance, early dermatitis and signs of incarceration. Many mothers in all classes of society are unable to cope with these problems and develop states and fears which, in turn, reflect themselves in the emotional development of the children. From the economic viewpoint the use of a truss may also have its drawbacks. As the child grows, one or more changes in size of a manufactured truss becomes necessary. Then there is the expense of frequent visits to the physician. If operation then becomes necessary, as it usually does, the earlier expense takes on the aspect of wasted time and money.

These problems do not make for satisfactory statistical analysis of the curative value of trusses. No wonder that, after examining the data available in the literature since 1910, I was unable to

conclude on a sound statistical basis that hernia can or cannot be cured by external appliances. The writers have lined up about equally on both sides, some stating summarily that a large percentage of cures can be obtained,[9, 12, 13, 14, 15, 16, 17] others doubting seriously if more than a sporadic cure can be expected.[2, 3, 11, 18, 19, 20, 21, 22, 23] A few, straddling the fence, feel that the truss is probably of little value, but use it anyway[6, 9, 10, 24] while operation is delayed. In my own experience, admittedly small, I have not been able to effect a lasting cure with a truss on any case. To make the disappointment complete, I recently had to repair a hernia I had positively "cured" by a truss eight years ago.

THE ANSWER: SURGERY

Since the management of inguinal hernias either by ignoring them or by applying trusses leaves much to be desired, the logical answer to the problem is surgery, which has the potentiality of furnishing an immediate and lasting cure. If this surgery could be geared to the special problems of even the youngest age, and still be made simple and absolutely safe, it would then be logical to recommend it for all cases. One would then have a practical solution to the hernia problem which makes the answering of the other questions only of academic interest. As early as 1904, Stiles[4] embarked on a program of surgery for all cases. Others who reached like conclusions have done their work in large pediatric centers.[11, 20, 23, 25, 26, 27] When large numbers of cases are handled, the surgeon acquires a technical proficiency which strongly reenforces the value of such a program. That smaller institutions also have the potentiality of approaching the ideal is evident from my own material, which consists of sixty-nine consecutive cases from my private service in a single 300 bed hospital.*

Hernioplasty was performed in sixty-four of these children, operation being refused by the parents in five cases. Forty-one children were less than 2 years of age when operated upon, twenty-one were less than 1 year and seven were less than 6 months. Two infants were 3 months old at the time of operation. In five infants incarceration was the immediate indication for operation. These patients were aged, respectively, 4, 6, 7, 8 and 20 months. In the three youngest of these five the parents had been unaware of the existence of hernias.

THE DIAGNOSIS

In the great majority of cases the diagnosis of inguinal hernia offers no obstacles. The history of a mass in the inguinal region which reduces spontaneously in a recumbent, relaxed position and reappears when standing or when the intra-abdominal pressure is increased, is strong presumptive evidence of a hernia. Usually the hernia is visible as a bulge in the inguinal region overlying the subcutaneous ring or, if small, as a disproportion between the lateral margins of the pubic fat. The large hernias can be seen extending into the scrotum. When the mass is palpated, it is soft and somewhat compressible and if it can be reduced, the diagnosis of hernia is established. In most cases the subcutaneous inguinal ring is too small to palpate

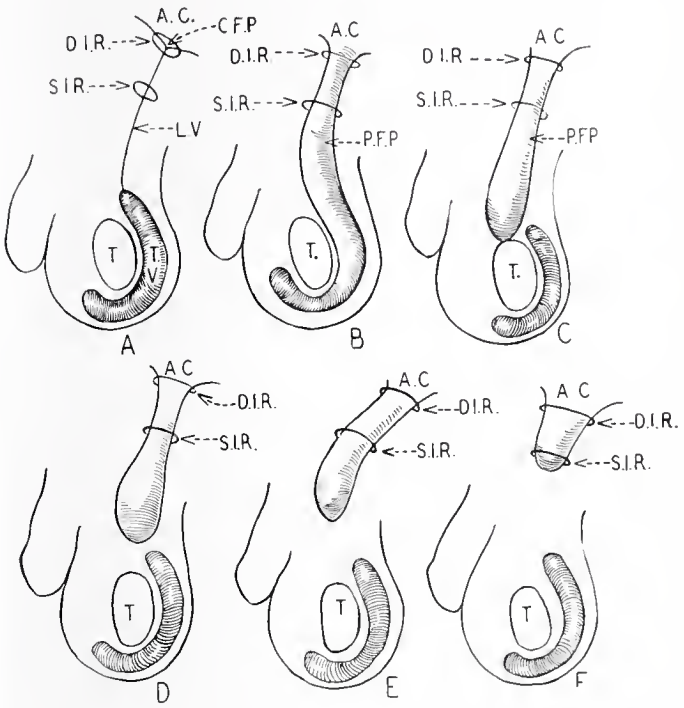


Fig. 1. A. In normal infants at birth the funicular process is closed, being represented by a thin fibrous strand, the ligamentum vaginalis. That portion of the process which lies adjacent to the testis becomes the tunica vaginalis.
B. Complete congenital infantile hernia. This uncommon condition results when the funicular process remains completely patent.
C. Low scrotal hernia. The funicular process remains patent down to the upper margin of the testis, but the hernia sac has no communication with the tunica vaginalis testis.
D. and E. Middle and high scrotal hernias.
F. Nonscrotal hernia (bubonocele). This common type of hernia occurs when only the upper end of the funicular process remains patent. Many cases of this type are difficult to demonstrate because the sacs are frequently empty during examination.
A.C. Abdominal cavity.
D.I.R. Deep inguinal ring.
S.I.R. Subcutaneous inguinal ring.
C.F.P. Closed funicular process.
P.F.P. Patent funicular process.
L.V. Ligamentum vaginale.
T. Testis.
T.V. Tunica vaginalis testis.

and even if palpable gives no information relative to the hernia.

Occasionally a bulge has been noted, only to disappear when the child is brought in for examination. Under these conditions the hernia can sometimes be made to reappear if the child is encouraged to perform some exercise like walking, running or climbing, or if he is lifted by the arms. Sometimes verification has to await a hurry-up visit to the child at the time the bulge appears. I think it unwise to recommend operation unless the diagnosis can be personally verified.

The differential diagnosis between hernia and hydrocele should offer no obstacle to one acquainted with the embryology and anatomy of the region.

*Additional staff service cases from two hospitals have been similarly handled, but they lack the study and follow-up for inclusion in this series.

During the descent of the testis an outpouching of peritoneum, the processus vaginalis (funicular process) descends with it and comes to lie alongside the testis and cord. The lower end of the processus becomes pinched off to form an envelopment around the testis, the tunica vaginalis, while the remainder of the processus normally becomes obliterated (fig. 1A). If the sac remains completely open down to the lower pole of the testis, a complete congenital infantile hernia is present (fig. 1B). Actually I have never seen a fully descended testis which did not have a separate covering of tunica vaginalis, and this type of hernia must be a curiosity. This series, however, contains seven hernias patent as far as the upper margin of the testis (low scrotal hernia) (fig. 1C). Other scrotal hernias of less descent were often seen, representing different degrees of patency of the processus vaginalis, middle (fig. 1D) and high (fig. 1E) scrotal hernias. When only the upper part of the processus vaginalis remains patent the bulge does not reach the scrotum and the typical bubonocele is present (fig. 1F). About one-half of the hernias were of the nonscrotal variety. If the abdominal end of the processus closed while a portion of it distal to the closure remained open, conditions are then present for the development of a hydrocele of the spermatic cord or of the tunica vaginalis testis, depending upon which portion of the processus remains open. To develop a hydrocele it is also necessary for the unclosed peritoneal process to act as a secretory membrane.

SURGICAL MANAGEMENT

Once the diagnosis of inguinal hernia is made, surgery is unequivocally recommended. If the operation is refused, I believe it is not wise to recommend the truss. Surgery is of course delayed if the patient's general condition needs to be improved. Since the great majority of these operations are elective, the time of election should find the deficiencies corrected and the risks decreased to the minimum.

In another paper[28] I have described in detail the histories and findings on sixty-nine consecutive cases with seventy-five inguinal hernias from my private service during the past five years. The sixty-four cases who agreed to operation were operated upon in accordance with the principle and operative technic described in that article. For the purpose of this discussion, only a brief summary of that material follows.

Preoperative Care.—All cases were admitted to the hospital the day before operation and were checked for communicable diseases just before admission. The eighteen hour period of hospitalization before operation allowed observation for temperature elevation and upper respiratory infection, and allowed for the routine blood and urine examinations. It has been my policy to encourage the mother to stay with the child throughout the hospitalization. When the patient is old enough to reason with, the surgeon should establish with him a close rapport and present a forthright and honest explanation calculated to relieve fear, surprise and confusion.[29] These important considerations cannot be overemphasized for the surgeon is not justified in repairing a physical defect if he is to create psychic damage potentially of greater harm. A preoperative sedative like rectal pentobarbital sodium is used if the patient is more than 1½ years to aid in alleviating the fears and apprehension associated with the strange enviroment, removal from the mother to the operating room and the administration of anesthesia. Atropine sulfate was administered to patients over the age of 6 months. Antibiotics were not routinely used in either the preoperative or postoperative periods.

Anesthesia.—Open drop ether was employed in all cases but two infants less than 6 months old who received cyclopropane. Induction was usually with vinethene. Perhaps just as important as the premedication in obtaining a smooth anesthesia was the psychic preparation of the child.

Steps of the Operation.—Since inguinal hernia of infancy and childhood is due to persistence of a patent funicular process, all that is required is to obliterate this process at the neck. Hence the most important steps of the operation are the careful dissection, the high ligation and the excision of the sac. Careful performance of these steps assures permanent cure. The remaining steps of the operation are concerned with obtaining easy access to the sac and with restoration of normal anatomy after the sac is exercised. The details of these steps have been described.[28] Some of the salient points are the use of the transverse incision, the use of nonabsorbable fine suture materials of high tensile strength, the meticulous and careful handling of the delicate tissues with appropriately sized instruments, absolute hemostasis, the substitution of subcuticular for skin sutures and the avoidance of dressings.

Postoperative Care.—This is quite unceremonious. The collodion applied after closure is a simple and effective seal against soilage. Dressings in the infant frequently turn out to be poultices of urine and feces. Since dressings are not used, harmful soilage from urine and feces is avoided by early diaper changes. Normal eating and physical activities are restored as soon as possible, usually by the evening of the operation. Postoperative pain is seldom sufficient to require medication. Parenteral fluids are not needed. Nearly all cases are permitted to go home the day following operation. The children are kept under home observation for one week after operation and then are permitted unrestricted activity. The ordeal of removing sutures is avoided by burying all sutures during the operation.

RESULTS OF SURGERY

No postoperative complications occurred. All wounds healed by primary union. A complete follow-up was obtained in all sixty-four cases. The shortest follow-up was for nine months, the longest

for sixty-two months. None of the cases has had a recurrence. Atrophy of the testis has not been observed.

While this is not a large enough series to state categorically that hernia repair in infancy and childhood is without danger, the absence of fatality, or even anxiety about the recovery of any of these cases, strongly suggests that properly executed hernioplasty in a healthy child approaches the theoretical maximal safety limit of any surgical procedure. It may offer even a greater degree of safety than treatment by truss or than no treatment at all, and has none of the drawbacks of these ineffective policies. Statistics frequently fail to draw a line between incarceration and strangulation, so that it is not possible to state what percentage of hernia cases terminate fatally from these causes. Death from strangulation has been reported,[4, 17] but the incidence probably is not above 1 per cent. Stiles estimated that untreated hernia cases have a mortality of 1.7 per cent; other figures go as low as 0.3 per cent. These figures do not take into consideration death from strangulation later in life. It is probable that many of the hernias occurring in adult life are recurrences or hangovers from hernias of infancy and, if repaired at an early date, might conceivably prevent these deaths. Nevertheless, it is encumbent upon the surgeon to show a mortality rate that does not exceed that of the untreated cases. If this can be done, and I believe it can under ideal conditions, then there is little excuse for procrastination or trussing of inguinal hernias of infancy and childhood.

SUMMARY

1. There is little likelihood that inguinal hernias of infancy will cure themselves spontaneously. Even though actual herniation may not recur the funicular process remains patent, predisposing to herniation under favorable conditions.

2. There is no clear evidence that trusses cure or are beneficial in inguinal hernias of infancy and childhood, and their use is not recommended.

3. Properly executed hernioplasty offers a simple and safe method of obtaining lasting cures in all cases of inguinal hernia of infancy and childhood. Surgery is recommended as soon as the diagnosis has been established, providing the general condition of the child presents no contraindication.

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REPORTS BETTER RESULTS FROM INTRAVENOUS USE OF ACTH

Intravenous injections of ACTH in greatly reduced doses produce equally as good or even better results than larger doses of the drug injected intramuscularly, according to a study made at the Veterans Administration Hospital, Long Beach, Calif.

A joint report on the intravenous use of the hormone was made in the June 9 *Journal of the American Medical Association* by Drs. William Mandel, Michael J. Singer, H. Rudolph Gudmundson, Lester Meister and Frederick W. S. Modern.

The doses used were only one tenth of one twentieth of those previously used, the doctors said. Commenting on the results of the treatment of twenty-five patients, all are responding "adequately," they said:

"No patients were refractory to the hormone when given by this method. There were no patients who relapsed while being treated with adequate doses. There were no patients who were refractory on subsequent treatment."

Subsequently, they treated twenty additional patients and the earlier results were confirmed.

The patients were treated for periods of from two to forty-two days for a variety of conditions, including rheumatic arthritis and bronchial asthma.

"Ten patients had previously received the drug in intermittent intramuscular injections," the report said. "In these the response to intravenous infusion of the hormone was usually more prompt and complete. Remissions after cessation of intravenous treatment were generally more prolonged."

PSYCHIATRIC SCREENING OF MEDICAL PATIENTS

CLAY F. BARRITT, M.D.
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It is desirable that the general practitioner understands to what extent his patient's illness is colored by the effects of disturbing life situations. Yet, with a routine medical history one will obtain little if any information about the individual's emotional life unless such information is volunteered. It is impossible for many physicians to attempt a psychiatric investigation with a detailed psychiatric history, so a patient's story must be evaluated with the idea of ruling out organic disease. Emotional problems occur so frequently, however, that a physician should know how to elicit pertinent data concerning the status of a gastrointestinal tract. Thus, he should be able to suspect psychiatric problems just as he might suspect a carcinoma of the sigmoid colon. Once he has a working diagnosis he may then proceed with more detailed studies to substantiate his initial impressions. If this were possible, it is felt that many psychiatric disorders could be recognized in their inital stages when a patent might be most successfully treated, perhaps by the physician himself.

In the experiment reported I was interested in learning whether a few direct questions used with a medical history would give as good an indication of a patient's emotional state as would an interview by a skilled social worker. Therefore, the questions used were included with the routine medical history as I interviewed patients on the medical service at Barnes Hospital. The conclusions from these questions were compared with the findings of a medical social worker who subsequently interviewed the patient. In this way it was learned that obtaining desired data was possible.

SELECTION OF PATIENTS

I utilized forty-three first admission patients admitted on the Private Medical Service at Barnes Hospital during part of the year that I was house officer on that service. Permission was obtained from ten of the private staff physicians to use their patients for this study. All of these doctors were practicing internists who sent their patients into the hospital for evaluation of their complaints and for treatment. Whether or not the patient would be included in the experiment was decided before anything was known about him. Three exceptions to this rule occurred. In these instances a patient was pointed out by another house officer as being a good subject for the study, it being his impression that the patient had disturbing problems that were producing symptoms. Only those persons who were considered too ill to comfortably undergo an interview were then discarded.

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Of the forty-three patients, twenty-six were men and seventeen were women. Their ages ranged from 20 to 69 years. Approximately 80 per cent of the cases fell between 35 and 60 years of age. Thirty-five were married, four were single, one was divorced and three were widows or widowers. All of them were white. The number of years of formal education ranged from six to nineteen years. The educational and occupational levels are tabulated in tables 1 and 2. The present illness of these patients ranged from two weeks to twenty-three years.

THE INTERVIEW

It was thought that if one could directly elicit disturbing life crises that occurred at the time the patient first became ill, one might be able to suspect that some or all of the patient's symptoms were precipitated by this disturbing life situation, i.e., that the patient was emotionally ill. Furthermore, if the patient reacted with symptoms to recurrences of crises or to symbols of a crisis, it seemed likely that the problem was an important factor in the production of the complaints. In addition, if the symptoms fell into a pattern of a known personality disorder, one ought to have further suggestive evidence for suspecting psychiatric difficulties. With these ideas in mind the questions centered around three main points: (1) Was there a life crisis or disturbing life situation that occurred at the time the patient first became ill?; (2) Did the patient react to symbols of that life crisis with any of his presenting symptoms?; and (3) Did the patient's symptoms fall into a pattern of a known personality disorder, e.g., an anxiety state, a depression? Information about point one was elicited by asking the patient the following simple direct questions aimed at the time he first became ill: "Was there any change in your work or trouble with your fellow workers that made you dissatisfied?"; "Was there any change in your recreational activity that was disappointing?"; "Were there any religious problems that disturbed you?"; and, "Were there any family problems that made you dissatisfied?" In order to decide whether the patient was reacting to any symbols of the life crisis with symptoms he was asked, "How did you feel when you thought about these problems?" Point three was decided by the interpretation of the symptom pattern.

These questions were asked along with the routine medical history usually when the conversation prompted them. Or, the patient would be asked "Have you had any nervousness?" If he replied in the affirmative, the questions would be used. If the conversation did not prompt these questions, they were asked at the end of the history after other information had been obtained. It was felt that the time used to take the medical history was helpful in establishing rapport necessary to help the patient discuss briefly some of his problems.

When the workup was completed, each patient was told that in the following few days a hospital medical social worker would see him. If this was

questioned by the patient, it was further explained that the purpose of this visit was to help his doctor determine whether or not the way he lived his life had anything to do with his illness. With this introduction only one patient was resistant enough to interfere with the interview.

SOCIAL WORKER'S INTERVIEW

To be as objective as possible it was decided at the beginning of the experiment that the social worker would read only the patient's history and not the diagnostic impressions. Any information elicited by the previous questions was not included in the admission history.

Five social workers were selected by the Director of the Social Service Department of Washington University Clinics and Allied Hospitals to participate in the study. These women were auxiliary personnel accustomed to doing this type of work. Selection of workers was based on their experience and demonstrated competence in interview method and accurate analysis of significant relationships in personality structure, environment, behavior and physical symptoms. All five case workers held Master of Social Work Degrees from schools approved by the American Association of Schools of Social Work.

Each patient was seen in an interview lasting approximately one hour. It was decided that one interview would be permitted to evaluate the emotional status of the patient. Questions posed by the patient in the course of the interview as to ways in which he might manage factors in his life which troubled him were handled with the suggestion that he discuss them with his physician.

The interview, conducted so as to allow as much spontaneity on the part of the patient as possible, was directed toward eliciting information about the same three broad topics as inquired about by the examiner: any important disturbing life situation at the time the patient first became ill; any current symptoms with relation to symbols of such crisis, and, symptom constellations which fall into a known pattern of personality disorder. The reports of the investigation contained the conclusion as to whether the patient had disturbing life situations that were producing symptoms.

INTERPRETATION OF THE PHYSICIAN'S QUESTIONS

If any one of the four questions comprising point one elicited a "yes" from the patient, the answer was considered positive whether or not details were offered. If the patient felt he had any symptoms which he presented when he thought about his disturbing problem or met with it either realistically or symbolically, point two was considered positive. Point three was positive when it was thought that some or all of the patient's symptoms characterized a pattern of personality disorder. At times a patient would complain of a little nervousness with only a few symptoms of tenseness and restlessness. If so, point three was considered positive. If any two of the three points were positive, the patient was considered to have disturbing life situations that were associated with his illness. If only one or none of the points were positive, the patient was considered emotionally well.

When the work was completed, the results of the two interviews were compared to learn whether the physician's conclusions paralleled the conclusions of the social worker.

CASE EXAMPLE

E. G., a 20 year old white female was admitted for diagnostic workup in April of 1949. She entered fearing she had turberculosis and an ulcerated stomach, and she complained principally of frequent headaches, blurring of vision, weakness, fatigue, night sweats, constipation, abdominal bloating with belching, and abdominal pain over the site of a previous appendectomy scar. These symptoms had been present for two and one half years and had been particularly worse in the last two years.

Table 1. *Educational Levels.*

YEARS	NO. OF PATIENTS
0-8	10
9-12	28
12	5

My questions brought out that at the time her symptoms began she had just started a job as a teacher in a local high school in her home town that she said was mildly distressing at times. She did not go into detail about this. In reply to, "Were there any family problems which made you dissatisfied?" she stated only that two years prior to admission she had been having some difficulty with a boy friend. When asked how she felt when she thought about either of her two mentioned problems she admitted that her symptoms became worse.

With eliciting a life crisis at the beginning of her illness, another one when she became worse, and learning that she had some of her present symptoms when she thought about these problems, it was evident that two of the three points were positive, and it was thought that this girl had emotional problems that were producing symptoms regardless of whether there was any organic disease present. It is interesting to note that she did not think that these were life crises and when asked whether she thought that these problems had anything to do with her illness, she replied with a definite "no."

The social worker who saw this girl obtained an impression that the patient was an immature individual whose symptoms began when she was having considerable difficulty with regard to suitors and approaching marriage and that the symptoms in the light of this patient's behavior pattern were hysterical in nature. These impressions were later confirmed by a staff psychiatist who was called in for consultation after a thorough medical workup had been noncontributory. Therefore, this patient was reported to have disturbing emotional situations that were producing symptoms, a conclusion paralleling that obtained from the initial questioning.

RESULTS OF THE EXPERIMENT

After collecting the data it was interesting to

learn the results that were obtained. If my impression agreed with that of the social worker, the case was listed as a true positive or a true negative. Of the forty-three cases interviewed thirty were true positives, one was a false positive, nine were true negatives and two were false negatives. With only one patient was the diagnosis uncertain. Therefore, considering the forty-two patients whose diagnoses were felt to be certain there was an agreement of approximately 93 per cent.

DISCUSSION

No note has been made about any diagnostic labels in the group of patients who were considered emotionally ill. This has been purposeful because the original plan was to screen patients who had emotional problems that were producing symptoms rather than to group the patients under any specific psychiatric diagnoses. To follow through with the original purpose it was felt undesirable to complicate the data with this information.

Table 2. *Socioeconomic Classification.**

Occupation	No. of Patients
Professional and semiprofessional workers	3
Farmers and farm managers	1
Proprietors, managers and officials	8
Clerical, sales and kindred workers	12
Craftsmen, foremen and kindred workers	4
Operatives and kindred workers	9
Domestic service workers	0
Protective service workers	0
Service workers, except domestic and protective	1
Farm laborers and foremen	0
Laborers, except farm and mine	1
Unknown	4

(Married women grouped according to their husband's occupations.)

* From the "Alphabetic Index of Occupations and Industries," 1948, U. S. Bureau of Census.

Furthermore, it is realized that this group of patients is not great enough in number to make the study statistically significant although the sample is a rather good one. However, the results were so uniform it was thought that this paper was well worth presenting to others who might be interested in using the questions with a medical history.

Also there has been no mention of the medical diagnoses in this study. It need only be said that most of the patients had additional medical problems. This simple interrogation could never take the place of a thorough medical workup for patients with emotional problems may also have organic disease. It is rather designed to be used along with a medical investigation, for patients with organic disease may also have emotional illness.

For any physician other than a psychiatrist who desires to know whether the patient under his examination is emotionally ill it is thought that these questions might be helpful. If the physician is interested in learning a great deal about his patient's emotional problems and the way they are affecting his illness, they may be helpful in guiding the psychiatric investigation. The social workers found the three main points beneficial in guiding the interviews with their other patients.

SUMMARY

This was an experiment conducted on the medical service at Barnes Hospital by myself and five associated medical social workers to determine the efficacy of using a few simple direct questions along with a routine medical history to screen patients who had emotional problems that were producing symptoms. It was learned that these questions as applied to this sample of patients and checked against more leisurely detailed examination by a skilled social worker had a high degree of efficiency in determining the presence or absence of emotional problems.

Phipps Clinic.

HORMONE THERAPY PAIN RELIEVER IN LATE BREAST CANCER CASES

Hormone therapy is a pain reliever but not a curative measure in advanced cases of breast cancer or those with metastases, according to a report of the Committee on Research of the American Medical Association.

For the obtaining of cures of breast cancer, the report emphasized the need for early diagnosis and the radical surgical removal of the tumor and surrounding tissue. These remain the primary mode of attack on the disease, it was stated.

The conclusions were based on reports of 886 cases in a nationwide cancer study being carried out by research groups under the coordination of the committee. The findings were published in the June 2 *Journal of the American Medical Association.*

The national study of the committee involves the effects of the use of hormones in advanced cancer. The report recommended that surgery be performed where possible or adequate x-ray therapy be administered in cases where the metastases are localized or are in accessible bone or soft tissue.

For most bone or soft tissue lesions in metastatic cancer, irradiation is the treatment of choice, it was pointed out. In the case of lung lesions or widespread bone or soft tissue metastases, hormone therapy was recommended.

Testosterone propionate, a male hormone, was found to be the drug of choice for the treatment of premenopausal women. However, it was pointed out that castration is usually more effective and should be the method of treatment unless there are contraindications.

For women five or more years past menopause, estrogen was recommended for the treatment of soft tissue and lung metastases. Bone lesions, it was found, responded equally well to both drugs but testosterone showed superiority in controlling subjective symptoms, especially pain.

All of the patients placed on hormone therapy had grown progressively worse under all other forms of treatment or had advanced cases before coming to treatment. The average survival of those placed on estrogen was 9.8 months and on testosterone 8.5 months.

"That steroid therapy may prolong life is demonstrated by the comparison of survival times for improved and unimproved patients," the committee reported. "Patients whose condition was improved by treatment with estrogens lived nearly twice as long as those showing no improvement."



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Postgraduate Review

THE SURGERY OF PEPTIC ULCER

A REVIEW OF THE RECENT LITERATURE

B. L. SINNER, M.D.,
ST. LOUIS

INTRODUCTION

It is remarkable that no important new principles relative to the surgical management of peptic ulcer have been recorded in the last twenty years. A few isolated improvements in the management of surgical complications, such as Pfeiffer's[1] work on gastrojejunocolic fistula, have occurred but the operation of choice in cases of peptic ulcer was then and still remains, subtotal gastrectomy. Subtotal gastrectomy has undergone many modifications since it was first used as a definitive operation for peptic ulcer but the prevailing opinions concerning what constitutes an adequate operation are now surprisingly constant among experienced surgeons who have followed many cases for five years or more. The ideal procedure includes the removal of all of the stomach distal to a line which joins a point on the lesser curvature where the left gastric artery joins the stomach wall to a point on the greater curvature where the left gastro-epiploic artery joins the stomach wall (fig. 1); it includes also the removal of the ulcer and the anastomosis of the uppermost jejunum to the stomach remnant behind the colon. This is not to say that one or the other of these components of the present day ideal procedure may not be modified occasionally without compromising the end result, but the evidence is strong that the incidence of ulcer recurrence in a large series of cases will be directly proportional to the number of times all of the criteria were not met in each case. It is for this reason that much of the present day literature on the surgery of ulcer deals with methods by which these criteria may be met with a low mortality in spite of obstacles previously considered insurmountable such as near fatal hemorrhage, gastrojejunocolic fistula, extensive involvement of the lesser omentum and the like. It should be stressed that any series of gastrectomies in which all or almost all of the operations were not done as described cannot be used to evaluate the operation and much of the confusion concerning the choice of operation for duodenal ulcer is due to the failure of surgeons, internists and general practitioners to differentiate between the inadequate and the adequate gastrectomy. The removal of half the stomach is little if any better than a gastro-enterostomy and will fail to produce permanent relief from ulcer about as often as gallbladder drainage will fail to prevent future attacks of cholecystitis.

At the present time vagotomy is, at best, in the experimental phase and, at worst, already on its way to oblivion. Its most glaring deficiency is that it leaves in the abdomen a pathologic condition which is often extensive. Time will determine whether the procedure has any place in the management of ulcer.

Gastro-enterostomy still is indicated occasionally if there is severe debility but, in view of the high postoperative incidence of marginal ulcer (34 per cent),[2] the contraindications to gastrectomy should be definite even in this group. A good rule of thumb in my own experience is that if a patient's general condition is such that he must be operated upon under local anesthesia, gastro-enterostomy is indicated. Even in such a patient, gastrectomy may have to be performed later; the following case history illustrates this point.

A 41-year-old male with a ten-year history of ulcer entered the hospital with persistent vomiting; a barium swallow indicated complete pyloric obstruction. Albumin and casts in the urine were mistakenly attributed to nephritis and three weeks were spent in an attempt to clear up his "nephritis," while the albuminuria continued and his nonprotein nitrogen rose above 100. At this point someone suggested that the renal disturbance might be due to loss of electrolytes from the pyloric obstruction and probably would not improve until the obstruction was relieved. Accordingly, a posterior gastro-enterostomy was done under local anesthesia, since his kidney function was so low that a general anesthetic was dangerous. He improved rapidly, although some of the kidney damage was permanent, as evidenced by persistent plus and 2 plus albuminuria; the nonprotein nitrogen returned to normal and he gained 25 pounds in eight months. At the end of this time, however, his ulcer symptoms recurred, and x-ray revealed a marginal ulcer. He was reoperated upon and a marginal ulcer was found firmly attached to and nearly perforating the transverse colon. He made an uneventful recovery from a subtotal gastrectomy. The obstructing ulcer has always been regarded by the proponents of gastro-enterostomy as the most favorable type of case for the operation and yet this man almost developed a gastrojejunocolic fistula eight months after his posterior gastro-enterostomy.

Since one cannot tell if a 70-year-old man will live two or twenty years after operation, contraindications to gastrectomy should be definite even in the aged before a compromise procedure is done.

WHEN IS A PEPTIC ULCER SURGICAL?

Moore, et al.,[3] studied all duodenal ulcer cases (997 cases) entering the hospital and outpatient department from 1942 to 1946 inclusive at the Massachusetts General Hospital. Special attention

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was given to the life history of duodenal ulcer. They were impressed with the large number of individuals who have ulcer symptoms on one or two occasions, sometimes severe enough to warrant hospitalization, but who then undergo some change which holds the ulcer diathesis in check for many years; women are especially fortunate in this regard. They were impressed also with the futility of nonsurgical management of certain cases of duodenal ulcer and arrived at a set of criteria by which such cases can be recognized before years of semi-invalidism have been endured. They have named this condition "porgressive virulent ulcer disease." The criteria for diagnosing it are as follows:

A. Primary Criteria:
   1. One perforation in the past.
   2. One acute hemorrhage requiring blood transfusion.
   3. Progressive pain over a two-year period while under a physician's care, in his normal environment, and at work.

B. Secondary Criteria:
   1. A male with duodenal ulcer symptoms under a doctor's care.
   2. A male with onset of symptoms before age 20 or after age 65.

If two or more of these criteria are present, one of which is primary, the diagnosis is progressive virulent ulcer disease and prognosis on nonsurgical management is poor and surgery is indicated. If three are present, surgery is urgent.

They concluded also that the mortality from hemorrhage, perforation and late obstruction in the patients of this group who are treated medically balance the intrinsic hospital mortality of definitive surgery.

DIAGNOSIS

Feldman[4] described five proven cases of walled off gas pockets complicating gastric and duodenal ulcer; the condition described is a localized pocketing separated from the lumen of the viscus, thus differing from the more common type of chronic perforation known as an accessary pocket or a pseudodiverticulum which shows on the film as part of the ulcer crater. The pockets are subhepatic in the stomach cases and lie on top of the cap or to the right side of the duodenum in duodenal cases. Some fill with barium and have a layer of air above the barium, others fill only with air which can be seen lying above the barium within the lumen. All cases were ambulatory and not acutely ill. The smaller pockets can be demonstrated only if the barium filled stomach and duodenum are x-rayed with the patient in the upright position. Besides the five cases proven by operation, there were others which disappeared while the patient was treated medically.*

* X-ray reproductions are excellent and the lesions are seen easily.

Feldman[5] also has investigated the incidence and diagnosis of peptic ulcer perforation into the lesser sac. After sending questionnaires to 350 surgeons and gastro-enterologists in this country, he obtained forty-eight replies suitable for statistical summary. Among 1,583 surgically proven cases of peptic ulcer perforation, there were sixteen perforations into the lesser sac, an incidence of 1 per cent. In addition to these sixteen, there were forty-one other cases included in his review. Of the fifty-seven, twenty-seven were duodenal, thiry were gastric; preoperative diagnosis was made in two of the fifty-seven; both of these were made by accidental spilling of barium into the lesser sac and its visualization by x-ray. These findings, along with the fact that he found only one article dealing with the subject, led him to the obvious conclusion that clinical diagnostic criteria of this condition are unknown. He promised a more detailed analysis of the fifty-seven cases soon.

Reynolds and Cantor[6] reported five cases of extensive peptic ulcers both gastric and duodenal, four of which were entirely overlooked by x-ray and one of which was erroneously diagnosed as gallbladder disease; this case, a posterior ulcer penetrating the pancreas, was even missed at operation because "distortion of duodenum" reported by the roentgenologist as due to gallbladder disease misled the surgeon. The preeminence of the clinical picture over negative x-ray findings is stressed by the authors.

PEPTIC ULCER IN THE VERY YOUNG

Zoebisch[7] found in 4,095 autopsies of children, from birth to 20 years of age, that fifty-one had peptic ulcers; twenty-five were gastric, twenty-six were duodenal. There were twenty-eight, in the first year of life, most of which died the first week. The remainder of the cases were scattered evenly throughout the twenty years.

One child diagnosed as having gastric neurosis and another as recurring colic were proven to have gastric and duodenal ulcers respectively by x-ray examination. Both responded promptly to bed rest, alkalies and bland diet.

Olavson[8] reported a seven to sixteen year follow up on Billroth II gastric resections on five patients from 15 to 19 years of age with peptic ulcers. He concluded that youth is no reason to ignore fundamental principles of gastric surgery for ulcer. All did well and had the same type of operation they would have had if they had been adults.

RELATION OF CANCER OF STOMACH TO DUODENAL ULCER

Orringer[9] reported that of 1,160 cases of cancer of the stomach, 0.4 per cent have a history of having had surgery for duodenal ulcer. He concluded that it is dangerous to assume that a recurrence of symptoms following operation for duodenal ulcer is necessarily due to marginal ulcer

and suggested that, if recurrent symptoms are persistent, roentgenologic examination is indicated.*

PROLAPSED GASTRIC MUCOSA: ITS RELATION TO PEPTIC ULCER

Melamed[10] reviewed fifty consecutive cases of prolapsed gastric mucosa occurring in three years at the Evangelical Deaconess Hospital in Milwaukee. Patients were from 16 to 69 years of age and there were four males to one female. There were nine peptic ulcers (diagnosis in duodenal cases based on duodenal deformity seen at x-ray examination); one was proven to be a duodenal ulcer at operation, another was proven to be a gastric ulcer. This is an incidence of almost 20 per cent, which is several times greater than the incidence of peptic ulcer in the population at large.

Bralow, et al.[11] reported five cases of prolapse of the gastric mucosa. Three were operated upon and each was found to have duodenal ulcer, gastritis and hypertrophied rugae. The other two had massive gastrointestinal bleeding, were not operated upon, and recovered; there were no other positive finding in these two cases. Subsequent x-ray examination revealed reduction of prolapse in one of the cases which was not operated upon.

Rudner[12] suggested that the cause of prolapse of the gastric mucosa is excessive peristalsis brought about by the same factors that cause peptic ulcer. He gave as the clinical picture epigastric fullness, heartburn and colicky pain beginning from one-half to one hour after meals and often relieved completely by vomiting, which must sometimes be induced. Pain may be accompanied by evidence of shock as in coronary thrombosis. Between attacks, the patient is often entirely comfortable. Repeated x-ray studies are often necessary to find the lesion. Persistent pain, bleeding or obstruction call for surgical intervention.

PEPTIC ULCER OF THE ESOPHAGUS

Cornell and Winkelstein[13] reported the case of a 50 year old man cured of an x-ray proven esophageal ulcer by resecting the distal three-fourths of the stomach.*

EXCESSIVE HYPERACIDITY

Machella[14] et al. reported the following case of a 42 year old white male with a three year history of ulcer type distress. First operation: three spontaneous perforations of jejunum just distal to duodenojejunal junction; these were closed. Postoperative studies revealed high acid values in material aspirated by tube from duodenum and jejunum; without stimulation the total volume of juice aspirated from the stomach in two and one-half hours was 1,142 cc.; the free acidity of the various fractions varied from 66 to 106. Second operation: subtotal resection plus vagotomy. Marginal ulcer occurred soon and insulin test revealed vagotomy to be incomplete. Third operation: vagotomy done through thorax; this also was incomplete according to insulin test. Marginal ulcer recurred promptly. Fourth operation: total gastrectomy with anastomosis of loop of jejunum to esophagus; no jejunojejunostomy was done. He gained 48 pounds in the succeeding nine months, ate three full sized meals daily and had no ulcer distress or dumping syndrome. Analysis of jejunal juice after gastrectomy revealed 310 cc. juice in one hour; free acidity of fractions averaged 38.

Pathologic report on specimen stated that there were acid secreting fundic glands in the antrum of the stomach down to the pylorus. How many was not stated.

A more detailed study of the geographic distribution of fundic glands in stomach specimens resected for ulcer might shed a great deal of light on the so-called "incurable ulcer diathesis."

LIFE ENDANGERING HEMORRHAGE

There are no advances in the surgical management of peptic ulcers which are bleeding seriously. It is true that experienced surgeons working in institutions which provide excellent anesthesia and enthusiastic and mature preoperative and postoperative care have progressively lower mortality rates in these cases each year. However, it is still impossible to make scientific decisions on a certain number of cases with life endangering hematomesis because the source of the bleeding is in doubt and because in more than 90 per cent of the cases, the bleeding will stop without surgical intervention. The literature is difficult to evaluate because of the varying criteria of "severe" hemorrhage. Since there are no definite criteria to separate those cases in which bleeding will stop from those cases in which it will not stop and since the patient's chances of surviving operation will depend upon the facilities at hand, every case will have to be individually evaluated. Since surgical judgment is founded on knowledge and since the lives of these patients depend primarily on the judgment of the surgeon, it perhaps will be well if the pertinent facts are listed briefly to aid in the evaluation of individual cases.

1. Most severe hemorrhages from the upper gastro-intestinal tract can be brought under control, at least for a few days, by blood replacement, rest and sedation.

2. Some cases will die if not operated upon and the sooner such cases are operated on the better will be the chance for survival. It is well to remember that a patient who has been living a normal life and eating a good diet up to the time of his severe hemorrhage is in a good physiologic state, except for his blood loss, and will tolerate extensive surgical procedures well if the blood is replaced; with each succeeding hour of bleeding,

* The authors think this may be the first proven ulcer of the esophagus cured by gastrectomy, but give credit to Wangenstein and others for the original work on gastrectomy for esophagitis.

* This survey and others published recently are not in accord with the widely held notion that duodenal ulcer and carcinoma of the stomach rarely occur in the same patient.

his tolerance for surgical or medical treatment diminishes.

3. If it is known that the patient is bleeding from a duodenal ulcer it should be realized that the operative procedure will probably be no simpler one day, one month or one year after the cessation of bleeding than it is during the bleeding period. The only reason for delaying surgery in a case of life endangering hemorrhage from a known ulcer, therefore, is to allow a patient in an advanced stage of malnutrition, or cardiac discompensation, or some other debilitated condition to recover his vigor before the operation is done.

4. The only way the hemorrhage from an ulcer

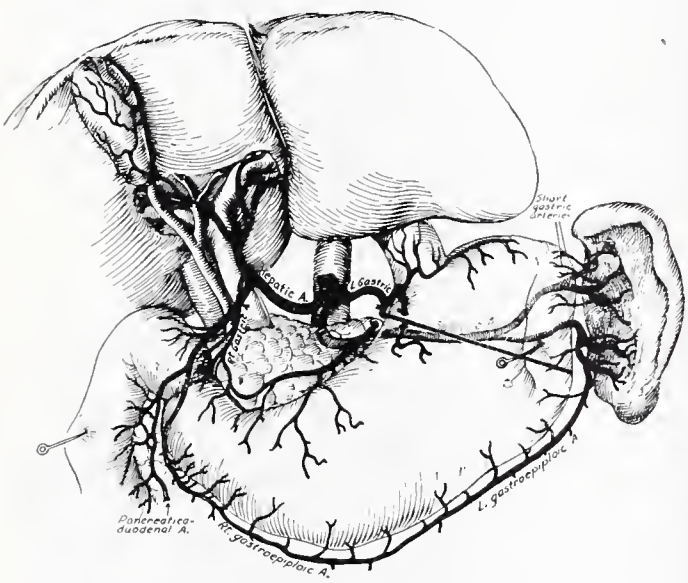


Fig. 1. Reproduced by permission from article by Frank Glenn, M.D., in *Annals of Surgery* of October 1950.

can be surgically controlled is to remove the ulcer; ligation of individual arteries is difficult because of the edema in the area and even if it is accomplished, it seldom stops the bleeding. I have seen a gastroduodenal artery bleeding in an ulcer crater continue to bleed after the same artery was compressed above the duodenum, so rich is the collateral blood supply in this area; similar observations have been recorded by others. It is agreed among experienced surgeons, therefore, that the only operation to be considered in a bleeding duodenal ulcer is radical subtotal gastric resection (fig. 1), including removal of the ulcer, since a less radical procedure will lead to marginal ulcer or further hemorrhage or both in a high percentage of cases.

5. Opinions vary concerning the value of early x-ray examination of patients with undiagnosed severe hematomesis. Wechksler and Odle[15] advise barium meal and x-ray of esophagus, stomach and duodenum (without manual manipulation) as soon as shock is well controlled. Stewart, e al.,[16] though not denying that x-ray is occasionally helpful, depend almost entirely on history and physical findings; in a series of fifty consecutive cases of massive bleeding they were wrong three times—one case operated upon for bleeding ulcers was proven later to have been bleeding from esophageal varices; in two cases, no cause for the bleeding was found. They state that in ulcer patients, epigastric tenderness can usually be found if carefully searched for and they feel that it is a considerable aid in diagnosis. They perform esophagoscopic examination in doubtful cases at the start of anesthesia.

6. Fatal bleeding can occur from single or multiple superficial ulcers of the stomach or even from diffuse oozing from the stomach mucosa. These conditions usually can be diagnosed by inspecting the interior of the stomach through an incision in the anterior wall since, even if the ulcers are invisible, the bleeding is so vigorous that its gastric origin can be determined. A subtotal gastric resection is indicated in these cases and careful examination of the specimen often will reveal ulcers or "pin point" bleeders which could not be seen on exploration.

7. While extensive operations can be done on patients with severe hematemesis with relative safety where experienced surgeons, physician-anesthetists and an unlimited supply of whole blood are available, it should be realized that if either of these facilities is absent, the mortality rate, even in the hands of experienced surgeons, will be prohibitive and the patient stands a better chance of survival if not operated upon during the bleeding period.

MORTALITY RATE AND COMPLICATIONS OF SUBTOTAL GASTRECTOMY

Glenn and Harrison[17] reviewed all the patients operated upon for peptic ulcer at the Cornell Medical Center in 1948. There were 136 cases and all are included in the report. An even 100 had subtotal gastrectomies, of which one died. Of the other thirty-six, nine had gastro-enterostomies, four of which were done because of fear that the duodenal stump could not be closed; the other five were done because of contraindications other than local. Twenty had vagotomies, nine of which were combined with gastro-enterostomy; all but one were complete according to the insulin test. The author was dissatisfied with vagotomy, either alone or in combination with other procedures, as an original operation for duodenal ulcer and was not much more enthusiastic about its efficacy in marginal ulcer following gastrectomy and gastro-enterostomy.

The complications encountered in the 100 gastrectomies were as follows:

Table 1. Complications

Complications specifically related to gastrectomy		Complications not specifically related to gastrectomy	
Postoperative Gastric Rentention	14	Mild Heart Failure	1
1-5 days	6	Pulmonary Complications	6
6-10 days	2	Asthma	1
11-14 days	3	Pneumonia	3
Over 14 days	3	Infarcts	2
Eviscerations	1	Thrombophlebitis	1
Deaths	1	Acute Retention	1
		No complications	76

The author was aware of the high incidence of postoperative gastric retention and was unable to account for it. Röden[18] reported an interesting series of gastric resections which may shed some light on the cause of postoperative gastric retention. The entire series received identical operations except that in the first half of the series the anastomosis was done with two rows of continuous catgut and in the last half of the series the anastomosis was performed with two rows of interrupted silk. Retention was twice as frequent and much more severe in the cases anastomosed with continuous catgut.

GASTROJEJUNOCOLIC FISTULA

Sinner and Von Kaenel[19] have called attention to the frequency with which gastrojejunocolic fistula goes undiagnosed for prolonged periods of time. Out of eight cases reviewed, only three were properly diagnosed even reasonably early. The other five were treated for periods of months and even years for nocturnal diarrhea, sprue, macrocytic anemia and inoperable cancer. They stressed the importance of questioning every patient with diarrhea for previous operation for duodenal ulcer since most gastrojejunocolic fistulas follow gastroenterostomy for duodenal ulcer. They concluded that the condition is more frequent than heretofore supposed since several of the cases reviewed by them nearly died in the home while under a physician's care, the true diagnosis being unsuspected.

Of interest was the low blood calcium and low blood chlorides in the only two cases in which those determinations were done. Although neither of these findings occasioned any surprise, they had not been reported previously and should serve to call attention to the need for giving these electrolytes parenterally before operation.

It was their opinion that the operation of choice is the dismantling of the fistula and subtotal gastric resection. Whether this should be done in one or two stages depends upon the physiologic state of the patient which, in turn, depends in large part on the duration of the diarrhea, which in these cases is usually extremely severe and is due not to the food passing from the stomach into the colon but to the irritating effects of the colon contents on the jejunal mucosa, as shown by Pfeiffer.[1]

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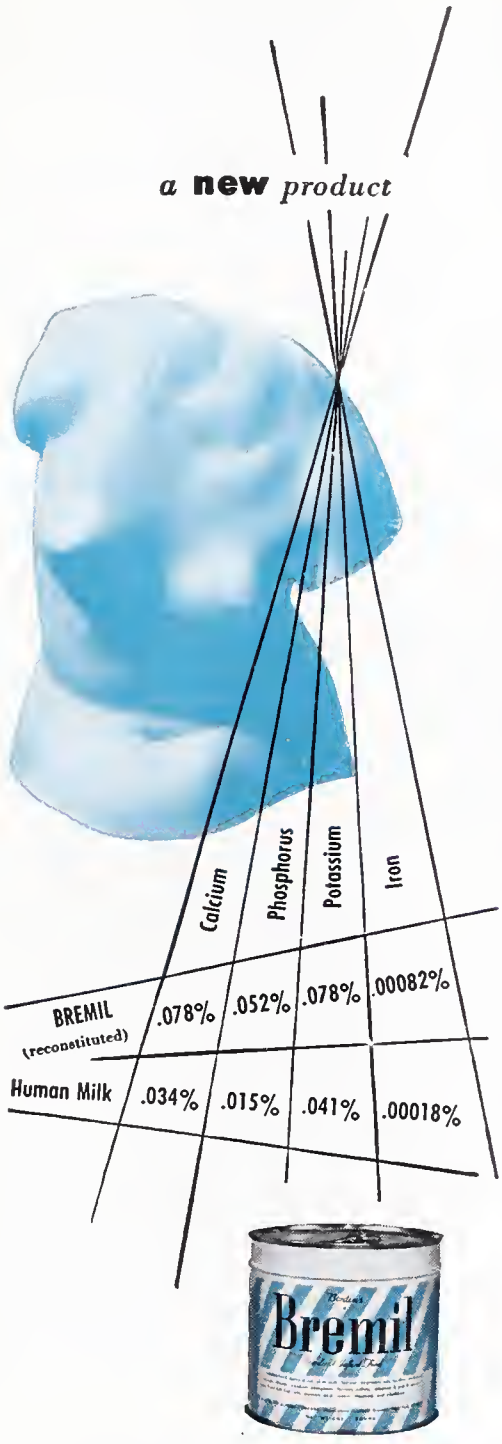
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Clinical Conference

DIAGNOSIS OF CANCER OF THE STOMACH

L. D. CASSIDY, M.D.
ST. LOUIS
J. V. FINNEGAN, M.D.
ST. LOUIS
D. C. WEIR, M.D.
ST. LOUIS
AND
J. P. WYATT, M.D.
ST. LOUIS

TEACHING POINTS

1. Cancer proved less common in the stomach than in the large bowel at Firmin Desloge Hospital, in white patients at St. Louis Municipal Hospitals, and in Negroes at Homer G. Phillips Hospital, as well as in the State of Connecticut,[1] though more common than the latter in England.[2]

2. The three most common symptoms of gastric cancer were anorexia, epigastric discomfort and nausea.[3]

3. The three most common signs of gastric cancer were anemia, weight loss and a mass palpable in the abdomen.[4]

4. Anorexia for heavy food was a symptom of the only five year survivor of gastric cancer in Firmin Desloge Hospital (case 2).

5. Anorexia for heavy food seems a common early symptom of gastric cancer.[5]

6. For diagnosis, fluoroscopy with x-rays of the upper gastrointestinal tract are required; and gastroscopy helps.

7. Gastric carcinoma developed in four of 129 patients with pernicious anemia.[6]

8. Gastric carcinoma was found in eleven of 1,544 patients with achlorhydria or hypochlorhydria.[7]

9. Women comprised about one third of patients with gastric cancer. The youngest patient was a woman aged 29.

10. Patient 2 is the only five year survivor of ten patients surviving gastrectomy among twenty-one resections and eighty-two explorations of the 157 gastric cancer patients at Firmin Desloge Hospital from 1933 to 1945.

REPORT OF CASE 1

CANCER OF THE STOMACH

Case 1. (J. J. Inkley, M.D.; W. K. Mueller, M.D.; W. A. Knight, Jr., M.D.)

Chief Complaint.—Vomiting of all meals for three weeks.

Present Illness.—A year previously, the patient complained of diarrhea and inability to keep down solid food. She had reduced her diet to warm milk and toast. Cold food caused gas and belching but hot food caused less discomfort. She was given a sedative and failed to return for a year. Meanwhile she began to vomit and for three weeks has vomited all meals and developed intermittent epigastric discomfort.

Past History.—Hemorrhoidectomy five years previously.

Family History.—Unknown.

Physical Examination.—The patient was thin. A 5 centimeter mass was palpable in the abdomen to the right of the umbilicus. It was firm, globular and movable and slightly tender.

Laboratory Findings.—Red blood cells were 3,600,000; Hb. 10.5 gm.; achlorhydria.

Fluoroscopy and X-ray.—Two irregular areas, one in the cardia along the greater curvature, the other in the pars pylorica, appeared on fluoroscopy. There was partial gastric retention.

Gastroscopy.—Lesion was seen, polypoid.

Diagnosis.—Carcinoma of the stomach.

DISCUSSION

L. D. Cassidy, M.D.: I saw this patient several weeks ago at a gastrointestinal conference and at that time she presented a misleading story. She complained then chiefly of diarrhea. She emphasized the short duration of her symptoms. However, to others of the staff she admitted dyspepsia of one year's duration and vomiting for three weeks or more.

The point to emphasize here is that, while the patient's history is often the most valuable clinical item, the story must be reviewed and resifted if no diagnostic trend is being uncovered, or if the statements do not fit the objective findings as in this patient with a mass palpable in the abdomen.

Many patients are worried that they might have a hidden cancer. A patient of middle age with dyspeptic symptoms of any type will be relieved when he has received a thorough examination, which must include a complete x-ray examination of the upper and lower digestive tract. When one can report these examinations normal, he then can tell the patient that his gnawing anxiety about cancer is groundless and give him a tremendous lift, making his complaints more tolerable to him.

Are x-ray films available on this patient?

D. C. Weir, M.D.: Yes, the films give a nice demonstration of an annular infiltrating defect in the lower third of the stomach with an irregularity in the pars media on the greater curvature.

Fluoroscopy by Dr. Mueller after barium swallow was originally the means by which the diagnosis of gastric carcinoma was established, and the x-ray films are confirmatory. By fluoroscopy two lesions were seen, one in the cardia the other in the pylorus. One must assume that he is dealing with an extensive gastric carcinoma.

W. A. Knight, Jr., M.D.: Gastroscopic examina-

Tumor Teaching Conference No. 60, October 20, 1949.
From St. Louis University School of Medicine, aided in part by Grant CT 619 USPHS and the Missouri Division of the American Cancer Society.

tion of this patient revealed a large polypoid fungating mass involving the distal two thirds of the stomach. A small area toward the cardia was free of growth.

Dr. Cassidy: Gastroscopic examination may positively identify the malignant nature of a lesion. However, a negative gastroscopy never contradicts a positive x-ray finding. The tendency of carcinoma to infiltrate the walls thus affecting the outline of the stomach is greater than its tendency to grow out within the lumen of the stomach and to show a growth visible through the gastroscope. Gastroscopy and x-ray are complementary examinations.

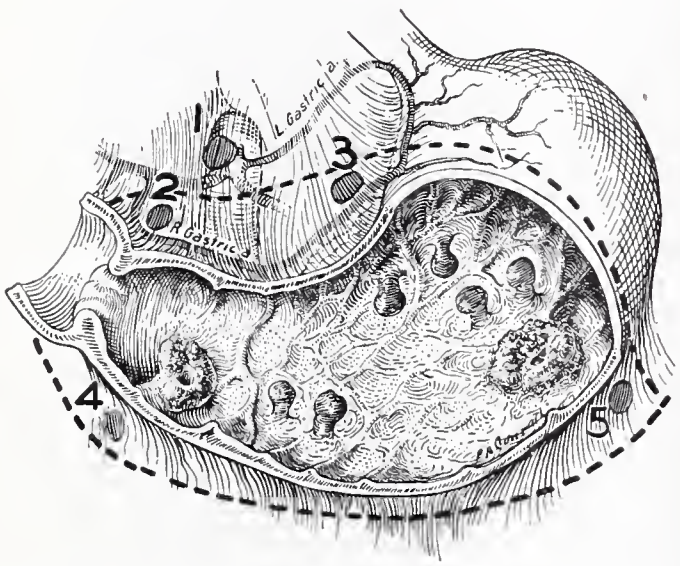


Fig. 1. Stomach of patient 1 whose first symptom was anorexia for solid food, one year prior to operation. Gastric resection along dotted lines removing both of two separate primary carcinomata which presumably developed on basis of polyps. Metastatic nodes 2-5 were removed; node 1 not removable.

Dr. Weir: I am happy the gastroscopist agrees with our x-ray diagnosis.

An interesting observation is the five year survival rate. At Firmin Desloge Hospital there is only patient 2 as a five year survivor, and there is one at St. Mary's Hospital. Last week at a similar conference in St. Louis City Hospital they reported no traceable five year survivors of gastric carcinoma.

I wonder if there is any series with and without surgery with which to compare results as to the length of life.

Dr. Cassidy: There was such a series, and the point made was that those who had no operation lived about as long as those who had operations. However, the feeling is now getting abroad, especially among surgeons, that the results are improving with the more radical extirpations recently being done. Statistics, after all, are flexible things.

There are two points about the size of the lesion in patient 1. Point one is that it does appear resectable on x-ray, but often the surgeon finds more involvement at operation than can be seen on the film. The second point is that large tumors, such as that in patient 2, are not always hopeless, but many are of a milder grade of malignancy than some smaller tumors and may metastasize less rapidly than the small tumor.

J. J. Connor, M.D.: I think patient 1 should be opened up and given the benefit of the doubt, resecting the lesion if possible.

Dr. Cassidy: What type of operation?

Dr. Connor: Complete gastrectomy.

Dr. Cassidy: Would you carry the resection into the duodenum?

E. L. Keyes, M.D.: I think one should as studies have shown histologic invasion of the duodenum by cancer from gastric carcinoma. I think operation offers patient 1 her only hope of five year survival.

FURTHER HISTORY OF PATIENT 1

Two days after this conference, on Oct. 22, the patient was operated on and a gastrectomy removing about 90 per cent of the stomach was performed by Drs. B. O. Hawk and E. J. Jordan. A double cancer was found (fig. 1) with one 6 centimeter tumor on the posterior wall high up near the cardia, the second lesion 4 centimeters in diameter at the pylorus on the greater curvature. The carcinomas were apparently of polypoid origin as there appeared also five polyps between the two cancers, measuring from 1 to 3 centimeters in diameter. There were nodes in both lesser and greater omentum. Histologically the lesion was adenocarcinoma, metastatic to the nodes (Dr. Moragues). It was necessary to remove part of the pancreas and the transverse colon with the stomach, as these were adherent.

The patient survived for fourteen months, improved temporarily and gained weight, but died at home on Dec. 6, 1950.

H. J. Goldman, M.D.: Last week I heard it asked whether or not gastric analysis has any value in the diagnosis of gastric cancer.

Dr. Cassidy: Anyone who does gastric analyses comes to the conclusion that there is nothing completely objective in their interpretation. However, they have a definite value. In the absence of hydrochloric acid the incidence of carcinoma increases and the majority of gastric lesions with no free hydrochloric acid will be malignant.

Suppose a lesion is described by the radiologist as ulcerous. He may not want to take a stand as to whether it is malignant or benign. If the patient shows no free acid, nothing supporting benignancy may stand against this dark portent, and surgery without delay is advised. It is just one factor added to others that may give a final opinion. By itself it will not stand.

J. V. Finnegan, M.D.: Achlorhydria was studied by State.[7] A series of 1,544 patients with either achlorhydria or hypochlorhydria were called back into the University of Minnesota Hospital clinic and given upper gastrointestinal x-rays. Gastric carcinoma was demonstrated in eleven of the 1,544 patients (teaching point 8).

Anemia is also common with gastric carcinoma, and Dr. Talboy recently has found fifty-four of

eighty-three patients with gastric cancer at Firmin Desloge Hospital with erythrocyte counts under 4.5 million, and hemoglobin under 12 grams.

Dr. Broun and I have reviewed our patients with pernicious anemia, following State's example, and were interested to find the same incidence, namely 3 per cent, of gastric carcinoma in patients with pernicious anemia as State found, our series being larger than his. Of our 129 patients with pernicious anemia, gastric carcinoma was found in four patients.

REPORT OF CASE 2

CANCER OF THE STOMACH, SEVEN YEAR SURVIVOR

Case 2. Male, aged 52. (H. S. Payne, M.D.; W. K. Mueller, M.D.; L. T. Moore, M.D.; L. Rassieur, M.D.)

Chief Complaint.—Epigastric pain of five weeks duration.

Present Illness.—Pain was first noted five weeks previously after cough. He had lost twenty-three pounds in weight in five years, seven pounds in the last week. Two hours after a meal of heavy food he would feel pain and fullness in the epigastrium and would vomit after two or three meals and feel relieved. Pain and fullness were less after lighter meals. Vomitus comprised food recently eaten. Stools were small but not tarry.

Physical Examination.—The patient looked older than 52, appeared pale and undernourished. The teeth were carious. There was tenderness in the epigastrium but no mass was felt.

Laboratory Findings.—Red blood cells were 3,600,000; Hb. 8.6 gm.; no free HC1 in gastric return; occult blood test positive.

X-Ray.—Marked pyloric obstruction with twenty-four hour retention, unable to state whether neoplastic or fibrotic (Dr. Mueller).

Diagnosis.—Stenosis of pylorus, possibly cancer.

Operation.—A pyloric ulcer 5 cm. in diameter was found perforating the pancreas. Subtotal gastrectomy was performed nevertheless (Drs. Moore and Rassieur).

Pathology.—Adenocarcinoma, no extension to lymph nodes (Dr. Wyatt).

Follow-up.—Patient regained weight, is living and asymptomatic in the seventh year (1951).

DR. KEYES: Because patient 2 survives five years and longer, his symptoms may be regarded as symptoms of early or curable cancer. Anorexia for heavy foods was one of his symptoms, in addition to loss of weight, epigastric pain (gas, fullness) and vomiting. He was anemic and achlorhydric.

Patient 1 also noted anorexia for heavy foods and a year before diagnosis stated that she could not keep solid food down. Cooper[5] for some years has regarded anorexia for heavy foods as the commonest symptom of early gastric cancer. I wonder what others feel about this symptom.

DR. CASSIDY: I think it a common and early symptom of cancer of the stomach. It is just possible that the loss of appetite for meat is earlier than for other foods.

If progress is to be made in the diagnosis of this particular disease we must develop this concept—that one must not wait until all the classic symptoms of anorexia, discomfort or gas, vomiting, weight loss, and anemia have developed.

DR. KEYES: Is rectal-digital examination worth while in a patient with cancer of the stomach?

DR. CASSIDY: Yes, for one may feel a "rectal shelf" due to gravitation of carcinoma intraperitoneally; of course, this indicates a bad prognosis.

On behalf of the younger house officers, I should like to emphasize a point of value, if I can put it across. I recall two patients with gastric cancer, one with a "rectal shelf," the other with a Virchow's node found in the (left) neck. The older attending physicians had overlooked both these metastatic manifestations which two younger house officers pointed out to them. If by rectum one encounters an unexpected mass, one has the diagnosis in hand.

DR. KEYES: What about the spread of gastric carcinoma as viewed by the pathologist?

J. P. WYATT, M.D.: Gastric carcinoma spreads with the major involvement occurring in the lymph nodes on the lesser curvature of the stomach, next in the lymph nodes on the greater curvature. I have seen but few instances in which the liver was invaded first by metastases.

In the past, it has been the practice to classify epithelial malignancy of the stomach on the basis of gross and microscopic subvarieties. Actually, little is gained by a classification involving various microscopic types of carcinoma; and one is far better off simply to call it carcinoma of the stomach either with or without metastases to the regional lymph nodes of the greater or lesser curvature.

DR. KEYES: What is a Krukenberg tumor?

DR. WYATT: A solid bilateral ovarian malignancy with replacement of ovarian tissue by signet ring cells metastatic from carcinoma primary in the gut.

DR. CASSIDY: The sole five year survivor of gastric cancer at Firmin Desloge Hospital, patient 2, is always a morale booster to this section, and I never mind seeing him presented again and again. In his case the diagnosis of cancer of the stomach was made early enough to operate upon him in time for salvage.

To sum up present ideas for the advancement of methods for diagnosing cancer of the stomach one might proceed from the basis of the more advanced type of cancer to the less advanced type.

One might start with a dyspeptic individual who feels better when his stomach is empty, who has vomited irregularly and lost his appetite and weight, and who presents himself with a mass one can palpate in the epigastrium. One might expect in but a few weeks to turn such an individual over to the funeral director with terminal gastric cancer.

Next, we might include another type of individual with loss of appetite, occasional epigastric fullness, gas or pain, yet no weight loss. Such a patient may have one significant finding, which one can obtain only by asking the question, "When did the pain start?" If he replies, "Just a few weeks ago;

all my life I have had a strong stomach," this means that something new is happening within this patient—gastric cancer, it may be.

Now, we might include a type of patient with indefinite dyspepsia which he tends to discount; yet the dyspepsia does not go away. Is the dyspepsia due to gastric cancer? One must find out.

Finally included are two types: first, a patient of middle age with mild malaise of short duration; and, second, any type of patient enough concerned about his health to inconvenience himself to consult a physician. Either type of patient may prove to have cancer of the stomach, and it is in these two types in which curable cancer can be found. That is why I teach that "the first symptom of cancer of the stomach is the suspicion in the mind of the physician."

Would Dr. Sherwin care to comment?

C. F. Sherwin, M.D.: I can only re-emphasize what you say. I think more attention should be paid to gastric symptoms than is done. Personally, however, I find difficulty in getting patients to undergo gastrointestinal x-ray series, or to be gastroscoped, both of which examinations ought to be emphasized.

How many patients were operated on in Firmin Desloge Hospital for gastric cancer?

E. J. Jordan, M.D.: From 1933 to 1945 eighty-three patients were explored and twenty-one resected of 157 patients with gastric cancer seen either in the outpatient or inpatient services at Firmin Desloge Hospital. Of ten patients who survived gastric resection only one patient, patient 2, survives five years or longer.

Finsterer[8] from 1913 to 1940 in total gastrectomy for gastric cancer could report only nine five year survivors (17.3 per cent) in an experience with 178 patients from 1913 to 1940.

Dr. Keyes: Our resectability rate from 1933 to 1945 was about one patient in seven resectable, or twenty-one gastrectomies per 157 patients with stomach cancer at Firmin Desloge Hospital. The resectability rate has risen recently and in 1949 to 1950 one patient in five proved resectable, five gastrectomies being done in forty successive patients with stomach cancer. The resectability rate in The New York Hospital from 1932 to 1940 approximated our present rate of one patient resectable in five, with fifty-seven gastrectomies in 264 of their patients with stomach cancer.[5]

The postoperative mortality rate from 1933 to 1945 at Firmin Desloge Hospital was eleven deaths in twenty-one gastrectomies. This high rate is being reduced, and during 1949 and 1950 no postoperative deaths have occurred in eight successive gastrectomies for cancer performed by three successive residents: Drs. B. O. Hawk, D. E. Basso and C. S. Sherwin. At the New York Hospital from 1933 to 1940 six patients died postoperatively following fifty-six gastrectomies of either "curative" or "palliative" type.

It is not always clear at the time of operation whether one is doing a "curative" or a "palliative" gastrectomy. Thus patient 2, our five year survivor, while found "operable" in 1943 by his surgeons, Dr. L. T. Moore and Dr. L. Rassieur, might be considered to have had gastrectomy "palliative" in type because his carcinoma had perforated from the stomach into the pancreas both grossly at operation and histologically. This one five year survivor at Firmin Desloge Hospital represents the salvage rate among the ten patients who survived gastrectomy of all types for carcinoma from 1933 to 1945. The five year survival rate at The New York Hospital from 1932 to 1935 was four survivors of nine patients surviving "curative" gastrectomies, a figure which would be lowered if they had included "palliative" gastrectomies in their statistics.

Dr. Sherwin: Even "palliative" gastrectomy I think is justified, because one can make the patient comfortable by removing a primary gastric cancer even if "inoperable"; a procedure I think equally justifiable to the giving of morphine for the control of pain in such patients.

Dr. Cassidy: The excellent thing about this meeting is the concentration of all the specialized abilities of the staff upon one problem. I think this an important method to develop, on a vaster scale; this pooling of thought and of effort may solve the problem of cancer.

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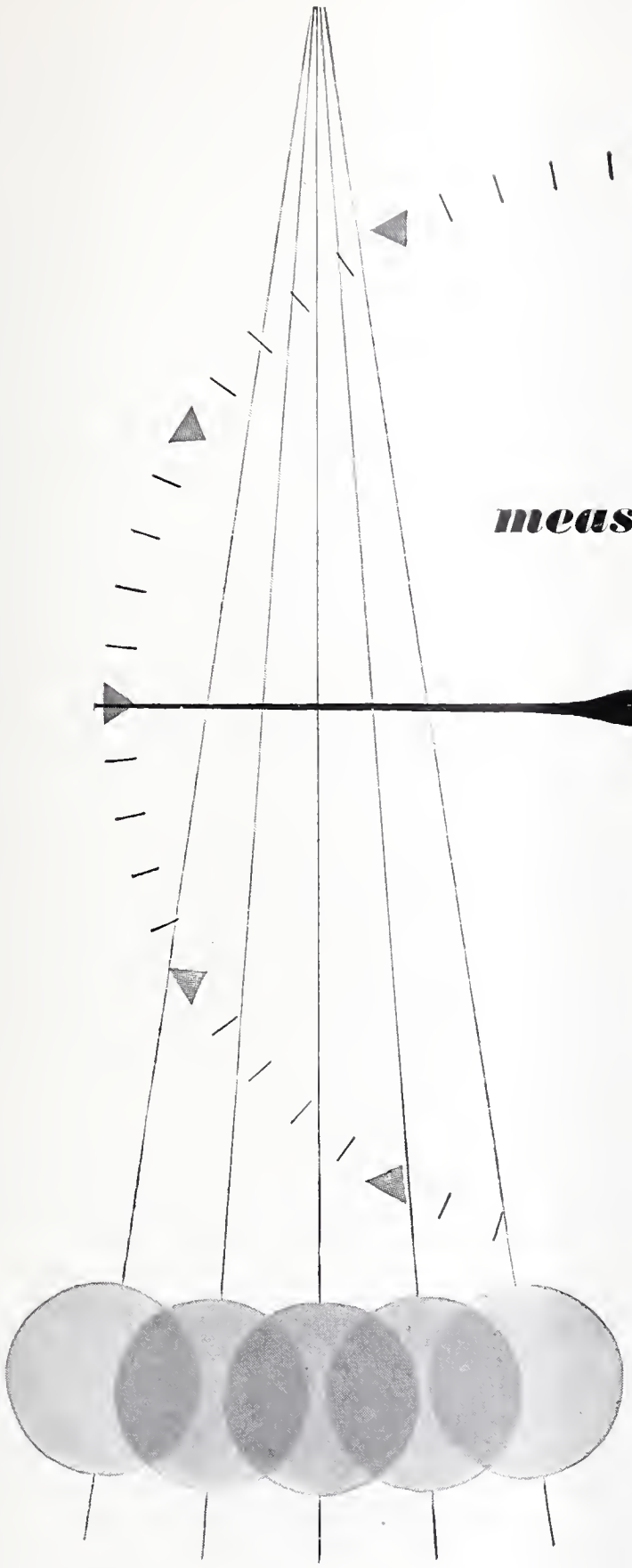
A.M.A. COUNCIL SAYS ALUMINUM UTENSILS NOT INJURIOUS TO HEALTH

The use of aluminum cooking utensils in no way is injurious to health, according to a statement issued June 1 by the Council on Foods and Nutrition of the American Medical Association.

The position of the council was made known as a result of periodical rumors that foods cooked in such utensils affect health because of injurious substances imparted by the vessel, according to Dr. James R. Wilson of Chicago, secretary of the council.

"Aluminum abounds in the earth's crust and is widely distributed in nature, being present in a wide range of edible plants," said the council. "Undoubtedly man has ingested small quantities of aluminum daily since he came upon the earth. Aluminum compounds also are important and useful therapeutic agents.

"The possibility that aluminum utensils can impart agents to the food cooked in them has been extensively investigated. Up to the present time there has been no cogent scientific evidence indicating that the minute traces of aluminum that may be imparted to food in the process of cooking are in any way injurious to the consumer.



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Case Report

MESENTRIC VASCULAR OCCLUSION

RECOVERY OF A CASE OF VENOUS OCCLUSION

J. WILL FLEMING, JR., M.D.
MOBERLY

THE PURPOSE of this paper is to emphasize the recognition and treatment of venous occlusion of the mesenteric vessels which is usually not accompanied by gangrene of the bowel. Such a case with recovery is presented. This condition can be successfully treated medically as compared to arterial occlusion, which is nearly always associated with gangrene and is a major surgical procedure involving resection of varying portions of the small and large intestine.

Mesenteric vascular occlusion has been recognized for more than one hundred years since Tiedermann[16] reported the first case in 1843. Virchow[17] described the disease in detail in 1847. Until the last few years survival depended upon whether or not the bowel could be resected and, if the patient withstood this serious procedure, enough viable bowel must be left to maintain digestive functions. Some remarkable resectons have been reported such as Meyer's,[12] in which all of the small intestine except eighteen inches, and the large bowel to the mid-transverse portion, were removed with recovery. Such case reports as this are undoubtedly arterial occlusion with gangrene. In recent years the anticoagulants[1] have been added to methods of treatment, especially for the patient who has venous mesenteric vascular occlusion without gangrene. These drugs are allowing successfully treatment of some of these patients without subjecting them to extensive surgery.

ETIOLOGY AND PATHOGENESIS

The occlusion may be either arterial or venous; and caused by embolism or thrombosis. Boyd[3] states that thrombosis is more common than embolism. Venous thrombosis is more frequent but the arterial type is much more rapidly fatal and is accompanied by gangrene of the bowel. This latter type is one in which radical surgery probably always will be the only chance of survival.

In 1938 Whittaker and Pemberton[18] reviewed sixty cases, nineteen of which were arterial, twenty were venous with eighteen involving the superior mesenteric vein. The remaining twenty-one cases were combined arterial and venous occlusion.

The condition usually occurs in elderly individuals with some degree of arteriosclerosis. Blood dyscrasias, polycythemia vera, intra-abdominal infections such as appendicitis, trauma, the incarceration of a hernia or an ulcerating carcinoma may be the causative factors of a thrombosis.

Embolism may occur in elderly patients with auricular fibrillation and cardiac failure.[7] Embolism also may follow recent coronary infarction or any type of vegetative endocarditis.

The pathologic condition resulting from vascular occlusion is infarction. It is usually of the hemorrhagic variety and involves the lower part of the jejunum and the ileum. Cases have been reported of infarction of practically all of the small intestine[5,6] and a large portion of the large intestine.[12] Macroscopic appearance of the involved segment is an intestinal wall which is thickened, edematous and dark red in color. Arterial occlusion rapidly changes to gangrene whereas, in venous occlusion, the process is much slower; in fact, the result is often hemorrhagic infarction without gangrene. It is in this latter type that spontaneous recovery is possible and that the anticoagulants are of greatest value and resection may be avoided.

Microscopically the contents of the lumen of the bowel may contain a large amount of serosanguineous fluid. The mucosal lining shows all stages of degeneration and edema. Vessels are dilated and engorged with red cells. Serous and muscular layer shows a hemorrhagic reaction.

DIAGNOSIS

The symptoms of acute mesenteric vascular occlusion do not differ greatly from other acute abdominal emergencies and the correct preoperative diagnosis is often difficult.

Campbell[14] suggests these chief differentiating diagnostic points between arterial and venous occlusion. In venous thrombosis there is a slow onset with mild to moderate colicky pain and the lower abdomen is tender to deep palpation. Low temperature without marked elevation of the white count is present. In arterial obstruction, however, there is a sudden onset with violent pain and the rapid onset of gangrene with corresponding clinical symptoms. The outstanding common findings of arterial and venous occlusion are tenderness, distention and moderate rigidity.

In some cases physical examination may be inconclusive. The pain may be out of all proportion to the meager abdominal findings. Early in the attack the bowel sounds are normal but if gangrene has supervended the bowel is silent. Occasionally the involved bowel can be felt as an indefinite mass. Rectal examination may reveal a tender, boggy mass in the cul-de-sac and there may be fresh blood on the examining finger.[13] However, it is possible that none of these findings may be present.

Laboratory studies should include the following: routine blood and urine studies, stool examination for blood, electrocardiogram to eliminate cardiac factors and to determine potassium metabolism, serum amylase to rule out acute pancreatitis, and an x-ray of the abdomen in the flat, upright or lateral decubitus position. Rendich and Harrington[14] have found that the diagnosis of occlusion of the

superior mesenteric vessels should be considered when a plain roentgenogram of the abdomen shows the bowel dilated to the splenic flexure, simulating a mechanical obstruction, yet a subsequent barium enema reveals no obstruction.

The following conditions must be considered in a differential diagnosis: appendicitis, intestinal obstruction, perforated peptic ucler, acute cholecystitis, acute pancreatitis, acute enteritis and volvulus.

TEATMENT

Exploratory laparotomy is always indicated, if only to confirm the diagnosis, unless the patient's general condition contraindicates operation. If the bowel is gangrenous, resection of the involved segment must be done. As stated proviously, well more than one-half of the intestinal tract has been resected and the patient survived; however, in a venous occlusion with viable bowel there is a greater chance for recovery if the abdomen is closed promptly and anticoagulant therapy started immediately. Heparin[8,10] is the quickest acting anticoagulant and the first dose should be at least 50 mg. intravenously and should be given immediately in the operating room. This can be followed by the slower and more prolonged Depo-Heparin in adequate amounts for at least forty-eight hours until the slower acting Dicumarol takes effect. A practical method of Dicumarol therapy is to give one dose of the drug daily and then clamp off the gastrointestinal tube for two or three hours. This tube should be passed immediately postoperatively if not already *in situ* at surgery.

Routine suporting measures should include: oxygen until the patient is awake and responding well; fluids, including blood and plasma if indicated, and parenteral vitamin C and B Complex.

Penicillin and streptomycin are given intramuscularly, and sulfasuxidine may be administered through the gastrointestinal tube,[13] or given by mouth, then clamping the tube. Papaverine hydrochloride in one-half grain dosage may be given intravenously or intramuscularly every four hours for the first forty-eight hours to alleviate vascular spasm.[9] Dicumarol should be continued for at least two weeks, and in some cases longer.

PROGNOSIS

The prognosis in the past for all types of mesenteric vascular occlusions has been poor. Boyd[3] states that spontaneous recovery of a venous thrombosis is possible. Others[2,5] believe the condition to be almost 100 per cent fatal without resection. They undoubtedly refer to arterial occlusion with gangrene. Some writers[11,15] believe the anticoagulants have not yet had a fair trail. There is no doubt but that the greater time interval between onset and operation greatly increases the mortality in either type of occlusion. It should be emphasized, however, that when the clinical signs present themselves and the general condition of the patient permits, an exploratory operation should be done to confirm the diagnosis and rule out gangrene of the bowel.

CASE REPORT

Mr. J. D., aged 66 years, a bricklayer, was referred to the Woodland Hospital on the morning of July 25, 1950, by his physician, Dr. P. V. Dreyer, Huntsville, who had seen him for the first time the previous evening. His complaints started, five days prior to admission, soon after eating his noon meal with the onset of paraumbilical pain which persisted and was associated with nausea. Emesis had occurred twice; late the evening before admission and the morning of admission. He had been taking only liquids during these five days. He had a normal soft bowel action the day of onset and no further movement until the day before admission when he had a small watery yellow stool. He had passed gas throughout this length of time.

Systemic history was irrelevant. The past history revealed that four years previously he fell from a ladder, resulting in an abrasion to the right foreleg. The abrasion healed in about two months but brown pigmented areas remained and the limb would swell if he was on his feet all day. Nine months previous he developed painful swelling of the right leg. This did not respond to the conservative measures of rest and an elastic support. He was hospitalized four months later after a "fainting" attack with marked dyspnea. A pulmonary infarction was suspected but not proven by serial x-rays. A few weeks in bed brought recovery but after being on his feet again he began having painful swelling of both feet and legs. The diagnosis at that time was thrombophlebitis migrans with a possible pulmonary infarction was made. The patient then had comparative good health for two months, until the present attack.

Examination on admission revealed a well nourished white male, moderately ill. The oral temperature was 99 F., pulse rate 88 per minute, respiration 18, blood pressure 130/70.

Head and neck examination, including the eyegrounds, revealed essentially normal findings. The lungs were clear and there were no heart murmurs. The abdomen was distended and generalized moderate muscle guard was present, most marked in the right lower quadrant. The tenderness was most pronounced in this area also. The extremities revealed pigmentation of the lower legs but no edema (patient had spent most of his time in bed for five days previous to admission). Rectal examination revealed a normal sized prostate. There was no feces in the rectum, no boggy mass in the cul-de-sac and no blood on the examining finger.

Routine laboratory examinations were reported as follows: the leukocyte count was 16,200 with 93 per cent neutrophils, hemoglobin 13.5 grams and erythrocytes 4,470,000; the urine had a 2 plus sugar, 1 plus albumin and centrifuging revealed from 50 to 70 pus cells per high power field.

A mesenteric vascular occlusion was suspected due to his recent past history of repeated thromboses. However, this could not be differentiated from atypical appendicitis.

The abdomen was opened by Dr. Avery P. Rowlette under a combination intravenous sodium pentothal and intratracheal nitrous oxide anesthesia. Approximately 400 to 500 cc. of free clear amber fluid was evacuated. The entire small bowel with the adjacent mesentery was a dark red color and the wall was

thickened with edema. A diagnosis of mesenteric venous occlusion was made and the abdomen closed. Fifty milligrams of Heparin was given immediately intravenously. The patient was returned to his room in fair condition.

The immediate postoperative course was not remarkable. Intranasal oxygen was continued until the patient was fully awake. Depo-Heparin 200 mg. (1cc.) was given intramuscularly and repeated daily for two additional days. On the third postoperative day only 100 mg. (½ cc.) was given. Daily clotting times by the Lee and White method were 27 minutes, 15 minutes and 7½ minutes, respectively, the first three postoperative days. Dicumarol was started the first postoperative day. Two hundred milligrams was given daily for two days, then 100 mg. daily. This drug was given by mouth and the Wangensteen tube clamped off for two hours. On the first and second postoperative days the prothrombin time was 24 seconds and 31 seconds, respectively, with a control of 15 seconds. On the third postoperative day the prothrombin time was 156 seconds with a control of 15 seconds. Five hundred cubic centimeters of whole blood and 10 mg. of Kappadione intramuscularly brought the prothrombin time to 48 seconds in six hours. Subsequent dosage of Dicumarol varied from 75 mg. to 100 mg. daily, depending on the prothrombin time. On the third postoperative day the patient developed auricular fibrillation which was controlled in six hours with one intramuscular unit of Digiglusin. This dose of digitalis was continued once daily for a week. Streptomycin 2 grams and penicillin 600,000 units were given daily for twelve days. The rectal temperature varied from 101 F. to 103 F. for seven days. On the morning of the seventh postoperative day the patient spontaneously passed a large amount of formed dark brown stool. Following this the oral temperature was never more than 100 F. and after another five days it returned to normal and remained so. On the eighth postoperative day the Wangensteen tube was clamped off for an hour three times daily, then tea, fruit juice or a nourishing liquid was administered. On the tenth postoperative day the tube was removed. The patient continued to have one or two soft dark brown stools daily after the initial bowel movement on the seventh postoperative day. Vitamin B complex and Vitamin C were given daily by intramuscular injection during his hospitalization.

Subsequent urinalyses yielded normal findings.

The patient was discharged from the hospital on his twenty-second postoperative day. He has had no complaints since dismissal except for moderate swelling of the legs on prolonged standing. He has taken 50 mg. of Dicumarol daily since dismissal. The first month prothrombin time was taken weekly, then every two weeks for two months, and the last five months only once monthly. The prothrombin time has been averaging about 50 per cent greater than the control. It is believed that he can be maintained on this regime indefinitely and prothrombin times taken at longer intervals. He continues to wear an elastic support on both legs. He has retired from his physical labor but is up and about all day long. He frequently walks eight or nine blocks at a time with no rest period.

COMMENT AND SUMMARY

The literature on mesenteric vascular occlusion has been reviewed briefly with emphasis on the recognition and medical management of venous vascular occlusion. A case was presented with recovery by the use of anticoagulant therapy alone. It is felt that this therapy is satisfactory in cases in which there is definite evidence of venous mesenteric occlusion without gangrene.

Woodland Hospital and Clinic

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NEUROLOGIST SAYS EPILEPTIC IS PILLORIED UNJUSTLY

The epilectic is unfairly pilloried in public opinion and law, according to Dr. William G. Lennox, a Boston neurologist, writing in the June 9 *Journal of the American Medical Association.*

Dr. Lennox, who is assistant professor of neurology at the Harvard Medical School and with the Children's Medical Center in Boston, said advice regarding marriage and children in such cases must be individualized.

"Assets that are transmissible, such as sound vital organs, good intellect, personality and social responsibility, may outweigh the liability of a tendency to seizures," he said.

"On the basis of family histories, the hereditary factor in epilepsy appears to be approximately the same as that in diabetes, one half that in obesity and one eighth that in migraine, but no state has as yet forbidden migrainous persons to marry. Unjustified discrimination in this case is born of fear. The success of present day therapy of seizures should reduce both fear and discrimination."

He reported on a study of the history of epileptic seizures, if any, of 20,000 near relatives of 4,231 epileptic patients. The incidence in these was 3.2 per cent.

Dr. Lennox concluded that the child of the average epileptic parent has a 30 to 1 chance of remaining free of seizures, although in individual instances the chances might be 10 to 1 or 100 to 1.

BLEEDING MECKEL'S DIVERTICULUM

J. ALBERT NIGRO, M.D.
KANSAS CITY

This case is reported because of the dramatic circumstances surrounding the entrance of a 21 year old man into the hospital with profuse rectal hemorrhage, who would, no doubt, have died had not the correct diagnosis been made.

REPORT OF CASE

On June 6, 1950, a 21 year old white male was admitted to St. Joseph Hospital, complaining of three bloody stools in thirty-six hours. The dark red material in the stools was separate from the feces. The physical examination was normal. Blood pressure was 154/82.

The laboratory findings were 4,030,000 red blood cells, hemoglobin 79 per cent, white blood cells 19,600, polymorphonuclears 70 per cent, lymphocytes 26 per cent and eosinophils 4 per cent.

The diagnosis at that time was rectal polyp.

The following day the patient had no rectal bleeding. His temperature was 98.6 F. and blood pressure had dropped to 122/78. The nonprotein nitrogen was 37.5 mg., blood sugar 89 mg. per 100 cc., blood chlorides 543 mg., sedimentation rate 5 mm. in one hour and 8 mm. in two hours. The patient was comfortable.

On June 8, early in the morning, the patient felt faint, became cold and clammy and passed about 300 cc. of blood per rectum. The blood pressure dropped to 80/52 and the pulse rate was 110 and weak and irregular. He was given a transfusion, vitamins C and K and placed on an ulcer diet. His hemoglobin was 62 per cent and red cell count was 3,650,000. By 5:30 p.m. he had passed one and one half pints of clotted blood and his pulse was 104 and weak. His blood pressure was 104/82.

The next day the patient was hungry and had a fair day. He had one dark red bowel movement. He was transfused and his blood pressure rose to 134/74. At that time the laboratory findings were red blood cells 2,320,000, hemoglobin 54 per cent, white blood cells 7,400, prothrombin time 19 seconds (control 20 seconds), hematocrite 22 per cent and platelets 208,000.

At 6:30 the next morning the patient passed a large amount of blood per rectum and one hour later passed 50 cc., making a total of 300 cc. His pulse was 120 and weak and he was extremely pale. Hemoglobin was 38 per cent, red blood cells 1,920,000 and white blood cells 9,800.

A transfusion was ordered and a proctoscopic examination, which proved negative for rectal polyp or varicosities, was done. The diagnosis was a possible duodenal ulcer. At 1:15 that afternoon the patient was taken to x-ray for a gastrointestinal series. A fluoroscopic examination of the chest was normal and an examination of the upper gastrointestinal tract revealed a normal esophagus, stomach and duodenum. Films at one half and one hour intervals showed the barium apparently progressing through the upper gastrointestinal tract. The examination was discontinued, however, because of the patient's extreme weakness.

Early that evening the patient had another profuse hemorrhage from the rectum, passing about 500 cc. of blood. His blood pressure was 130/70, pulse 120 and weak. The patient was extremely weak and massed red blood cell transfusion was ordered. At that time a diagnosis of telangiectatic areas in the intestine was entertained.

At 7:00 that evening upon seeing the patient on surgical consultation he was found to be listless. He was receiving massed blood cell transfusion. His blood pressure was 80/50 and his pulse was 120, weak and thready. Blood was coming from the rectum unmixed with feces or mucus. The abdomen was soft with no localized tenderness or rigidity. No masses were palpable and the liver, kidneys and spleen were normal. There were no purpuric spots, tenderness or pain. There were no symptoms of obstruction and no joint swelling or pain. A preoperative diagnosis of a bleeding Meckel's diverticulum, due to gastric ulceration, was made. One cc. of Benadryl and five transfusions were given in rapid succession.

At 8:30 p.m. the patient's hemoglobin was 55 per cent, his blood pressure 134/70 and he had urticaria. Operation was begun. A low rectus incision was made and a Meckel's diverticulum, approximately three feet from the ileocecal valve, measuring 4 cm. in length and 2 cm. in diameter on the antimesenteric portion of the ileum was found. A separate artery and vein supplied the diverticulum and there was gross hemorrhage within the diverticulum and distal portion of the bowel. A transverse diverticulectomy was performed. Postoperatively he was given penicillin, cremesuxidine, vitamins, one transfusion, heptuna and crude liver.

On June 11 the laboratory report was hemoglobin 62 per cent, red blood cells 2,710,000, white blood cells 16,500.

On June 13 the patient was allowed out of bed and the laboratory report was hemoglobin 64 per cent, red blood cells 3,060,000, white blood cells 9,000.

On June 14, his hemoglobin was 71 per cent and on June 17 the sutures were removed and the patient was dismissed in excellent condition.

Approximately one year following the operation, the patient states that he is in perfect condition, has no rectal bleeding, has gained 20 pounds in weight, his appetite is good, he has had no abdominal pain and no nausea or vomiting.

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CONCEPTS OF WHOLESOME FOOD EXPLAINED BY A.M.A. COUNCIL

Because of the widespread use of chemicals in connection with the growth, storage, preparation or final processing of foods, the Council on Foods and Nutrition of the American Medical Association offered the following definition:

"A wholesome food is a product which makes a significant contribution to human dietary requirements and which is clean and free from micro-organisms and chemical additives of such quality or in such quantities that they may be directly injurious or result in reduced nutritional quality."

The council pointed out that it long has been recognized that nutritional status is closely related to the quality of food eaten, and added:

"It also has been recognized that wholesome foods must be clean and free from extraneous matter that may be incorporated as the result of careless or uncleanly methods of growth, storage or processing. Although micro-organisms which contribute to the value of a food may be incorporated intentionally or accidentally, disease-producing organisms have no place in foods intended for human consumption.

"Although these basic concepts have acquired general recognition, the development recently of a large number of chemical technologic aids has emphasized the necessity for reexamining our idea of a wholesome food, particularly from the point of view of its freedom from chemical additives which may be harmful to the consumer because of toxicologic effects or because their incorporation in food causes or makes possible the reduction of nutritive value."

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PRESIDENT'S PAGE

Recently, the *Saturday Evening Post* published an article by Dr. Franklin Murphy, Dean of the University of Kansas School of Medicine. Everyone interested in health should read this article. It details the plan now operating in Kansas to educate physicians, to improve medical care by postgraduate instruction, to supply rural communities with competently trained medical men and more hospital and health facilities. To anyone who has observed this plan, which revolves about the University of Kansas School of Medicine, in operation, there can be no doubt of its success.



The people of Kansas are fortunate indeed that their medical needs have been recognized and that their own state school is taking such definite steps to make competent modern medical care available to the farthest corners of their state.

We in Missouri need just such a plan as Kansas has but without a four year medical school specializing in training students from Missouri, and interested primarily in living and practicing in Missouri, it is difficult to see how any such plan can be instituted in our state.

The Missouri State Medical Association repeatedly and consistently has advocated a four year school in Missouri together with plans for better and more medical care and facilities in rural Missouri.

However, in making these recommendations, we recognize that the establishment and maintenance of a medical school is unusually expensive and certainly plans for medical education should be kept within the state's ability to pay. Such a plan has been offered by several members of the Board of Curators of the University of Missouri contrary to a much more expensive and less workable plan proposed by the other Curators. We would not in any circumstances recommend the establishment of this school just on the basis of its relatively smaller cost but it also offers far better training and clinical facilities which have been enumerated many times previously. This latter is of prime importance in training medical students. It should produce top notch physicians—capable of rendering a worthy medical service to the citizens of Missouri.

Such a school should be a key to a plan similar to that in Kansas, the best rural health plan so far. Certainly the people of Missouri deserve no less.



Editorials

THE POSTWAR CANCER RECORD

Efforts toward all phases of the cancer problem have constantly been intensified and the Metropolitan Life Insurance Company has compiled figures on the period since World War II, or 1946, to shed some light on what is being accomplished. There has been not only an intensified program of public health education stressing the early detection and treatment of cancer but there has been a more emphatic and expanded educational effort with practicing physicians and an increase in diagnostic facilities. The number of special cancer hospitals has increased and medical and dental schools are concentrating attention on the problem and cancer research has been stimulated by both private and public funds. While it is still too early to find any definite answer to the effect on a broad scale, mortality figures give some encouraging signs.

A comparison of death rates for the periods 1946-1947 and 1949-1950 shows reductions in mortality from the malignant neoplasms, including leukemia and Hodgkin's disease, among white females at ages 25 to 74 years and only a slight change at ages 1 to 24 years. In white males there was an improvement at ages 1 to 14 years and only a small increase at ages 15 to 24 years. However, the death rate rose appreciably (12.6 per cent) at ages 25 to 44 years and for the higher age groups the rates increased by about 3.5 per cent.

The favorable developments in the cancer picture are most evident when the recent trend of mortality is studied according to the primary site of the malignant growth. For the accessible sites as a group, both sexes experienced declines in mortality, white males by 2.4 per cent and white females by 7.2 per cent. Among white females, for each of the specific accessible sites, except the breast, the trend in mortality was downward. In the case of cancer of the breast, there was practically no change in the death rates. For cancer of the uterus, the death rate dropped by 11.5 per cent in the short period under review. The only important site to show a reduction in mortality among white males is the buccal cavity and tonsils, where there was a 13 per cent improvement.

With inaccessible sites, white females experienced a 1.1 per cent decrease in death rates from 1946-1947 to 1949-1950, but white males show a 4 per cent rise. Both sexes showed improvement for such sites as the stomach, the intestines and duodenum, the rectum and anus, the liver and biliary passages, a residual category consisting of other digestive organs and the peritoneum and the bladder.

There are several important inaccessible sites that show sizable increases in cancer death rates. Most important among these are cancers of the lung, pleura, mediastinum, bronchus and other respiratory parts and the pharynx. Taken together, the death rate for these sites increased by 30.4 per cent for white males and by 10.3 per cent for white females. Important elements in this situation are the improved diagnostic technics, the increasing alertness of the physician to the condition and, to some extent, the discovery of such cancers incidental to mass x-ray examinations. However, it is not yet apparent to what extent these and other unknown factors are contributing to the upward trend in these cancers. Both sexes also had a rise in mortality from cancer of the pancreas. The death rate for cancer of the ovary and other female genital organs went up by about one sixth within the postwar period.

For both white males and white females, there was a rise in the death rate from leukemia, probably as a result of improved diagnosis. The recent change in the mortality from Hodgkin's disease was immaterial.

Some of the statistics used in these conclusions follow: For males from 0 to 74 years the death rate per 100,000 in 1946-1947 was 123.6 and for 1949-1950, 128.5; for females the figures were 108.2 and 104.9. For the age group 1 to 14, males showed a death rate of 9.4 in 1946-1947 and 8.9 in 1949-1950; females 7.0 and 7.1; ages 15 to 24, males 9.1 and 9.3 and females 6.7 and 6.9; for ages 25 to 44 years, males 29.3 and 33.0, females 47.4 and 43.6; for ages 45 to 64, males 309.1 and 320.4, females 277.3 and 267.6; for ages 65 to 74 years, males 968.1 and 1,000.6, females 694.3 and 691.2.

AMERICAN MEDICAL ASSOCIATION OFFICERS

Louis H. Bauer, M.D., Hempstead, N. Y., was unanimously chosen President-Elect of the American Medical Association at the June 14 session of the House of Delegates. He will take office at the annual session in Chicago in June 1952.

Oscar B. Hunter, M.D., Washington, D.C., was named Vice President. Reelected were George F. Lull, M.D., Chicago, Secretary; J. J. Moore, M.D., Chicago, Treasurer; F. F. Borzell, M.D., Philadelphia, Speaker of the House of Delegates, and James R. Reuling, Bayside, N. Y., Vice Speaker.

David B. Allman, M.D., Atlantic City, was named to a three year term on the Board of Trustees succeeding Dr. Bauer. Walter B. Martin, M.D., Norfolk, Va., was reelected for five years.

The 1954 annual meeting will be held in San Francisco, the 1953 meeting in New York and the 1952 meeting in Chicago. The 1954 clinical session will be held in Miami, Fla.

Organization and Economics

NEWS

Melvin A. Casberg, M.D., St. Louis, delivered the commencement address at Seattle University at Seattle, Washington, on June 1. He spoke on "Relative Values in Professional Education."

J. B. Steinmetz, M.D., Clarkton, spoke before the Clarkton Kiwanis Club on April 19.

Joseph A. Conrad, M.D., Chillicothe, addressed the Progressive Art and Study Club of Chillicothe on April 26 on "Cancer."

Avery P. Rowlette, M.D., Moberly, has been elected president of the Hodgen Surgical Club, composed of surgeons of eight states, all of whom have been house officers of St. Louis City Hospital.

Paul Murphy, M.D., St. Louis, was elected president of the Missouri Tuberculosis Association at a meeting on April 21.

Menorah Hospital, Kansas City, has announced the opening of a psychiatric unit to accommodate thirty-two patients and staffed by a qualified psychologist, psychiatric social worker and occupational therapist.

Otis E. James, M.D., Kansas City, discussed "Low Back Pains" before the staff of the Lexington Memorial Hospital, Lexington, on May 8.

Charles E. Carlton, M.D., Stoutland, was honored for fifty years of service to his community at a meeting attended by more than six hundred on May 21.

Herbert S. Miller, M.D., Jefferson City, was the principal speaker at a meeting of the Missouri Association of Social Welfare at Mount Vernon on April 27.

William K. McCall, M.D., Laddonia, was honored on May 17 as a fifty year Mason.

George H. Jones, M.D., Kansas City, was guest of honor at a dinner of the Greater Kansas City Academy of General Practice on May 24 and was named "General Practitioner of the Year" for 1951.

James C. Chilton, M.D., Hannibal, was honored by the Marion-Ralls County Medical Society at a dinner on May 24 upon his completion of sixty years of continuous practice.

Herbert L. Mantz, M.D., Kansas City, presented a paper on "Permanent Tuberculosis Control Procedures on a National and Worldwide Basis" before the National Tuberculosis Association's annual meeting in Cincinnati May 14 to 18.

William B. Barry, M.D., Kansas City, discussed "Complete Tonsillectomy" before the Douglas County (Kansas) Medical Society at Lawrence, Kansas, on May 8.

Drs. J. E. Cannaday, C. B. Trader, W. T. Bishop, Sedalia, and C. L. Parkhurst, Houstonia, were honored at a banquet given by the Pettis County Medical Society on May 28 celebrating the completion of fifty years of the practice of medicine by the four physicians.

Ten members of the class of 1901 of the Washington University School of Medicine held a reunion on June 1 at the Chase Hotel. Missouri members of the class who attended are Drs. Irvin J. Harris, Clayton; W. C. G. Kirchner, J. R. Lionberger, Pierre I. Chandeysson, William G. Krenning, St. Louis; Garrett Hogg, Springfield. Drs. Robert E. Schlueter and Robert J. Terry, St. Louis, teachers of the class, also attended.

E. E. Glenn, M.D., Springfield, was elected president of the Missouri State Chapter of the American College of Chest Physicians at a meeting on April 22. Other officers elected were L. E. Wood, M.D., Kansas City, president-elect; A. J. Steiner, M.D., St. Louis, secretary-treasurer; J. S. Hoffman, M.D., Kansas City, program chairman. Charles A. Brasher, M.D., Mount Vernon, presided as president at the meeting.

MUSINGS OF THE FIELD SECRETARY

More than 200 general practitioners and guests attended the third annual meeting of the Missouri Academy of General Practice at Sedalia on May 17. Many good reports concerning that session are heard around the state.

At the 1951 Annual Session of the Missouri State Medical Association in Kansas City, the House of Delegates transferred Ray County from the First Councilor District to the Sixth Councilor District to make it administratively possible for the Ray and Lafayette county medical societies to hyphenate. Linn County likewise was transferred from the Second Councilor District to the First Councilor District for the purpose of joining the Linn County Medical Society in a proposed hyphenation with Grundy-Daviess, Caldwell-Livingston, Mercer and Harrison county medical societies.

A state-wide luncheon meeting of organizations and agencies concerned with the 1950 Midcentury White House Conference on Children and Youth was held at the Missouri Hotel, Jefferson City, on May 26. This session was called by the Missouri Association for Social Welfare for the purpose of discussing ways and means of carrying out various recommendations of the Midcentury Conference.

Plans are now under consideration by the Missouri Health Council for sponsoring a one day conference, September 19, in Jefferson City, on "The General Medical, Dental and Hospital Care of the Indigent Sick." The objective of this conference will be to explore the problem in Missouri pertaining to this subject. More details as to the program for this meeting will be given at a later date.

DUNKLIN COUNTY MEMORIAL HOSPITAL

The Dunklin County Memorial Hospital, Kennett, the first hospital in Missouri on which construction was begun under the Hill-Burton Act, was dedicated on May 13 and began operation during that week. Several other hospitals in Missouri, assisted by the Hill-Burton Act, which were started later opened earlier this year.

The hospital has a normal capacity of sixty-five beds and a maximum capacity of eighty-six, with fourteen bassincts and a nursery for infants. The institution is complete in almost every detail with such facilities as attractive waiting rooms and snack bar for visitors in addition to the excellent medical and surgical facilities for patients.

Funds for the hospital were obtained from the federal government, the state and the county. Dunklin County had two bond issues and a special tax. The movement for the hospital was initiated largely by the Dunklin County Farm Bureau.

One of the most prominent individuals in the project from the beginning to the completion was Paul Baldwin, M.D., Kennett, now chief of staff and chairman of the board of trustees. Dr. Baldwin presided at the dedication ceremonies which were held near the main entrance to the hospital. A program, appropriately planned, was attended by a large group. Open house following the program drew many to view this latest progressive step by Dunklin County.







Paul Baldwin, M.D., Kennett, chairman of the board of trustees, presides at dedication ceremonies (upper left). Buford G. Hamilton, M.D., Jefferson City, Missouri State Health Commissioner, was one of the speakers at the dedication (below). The Dunklin County Memorial Hospital.

NEW MEMBERS

Brenna, Robert A., M.D., St. Louis.
Bryan, Theodore L., M.D., St. Louis.
Bussman, Donald W., M.D., Clayton.
Eastwood, Douglass W., M.D., St. Louis.
Hartman, Paul T., M.D., St Louis.
Holtzman, Samuel, M.D., Joplin.
Hutchinson, James H., Jr., M.D., St. Louis.
Inkley, John J., M.D., St. Louis.
Kantor, Samuel, M.D., Kansas City.
Kistner, William F., M.D., St. Louis.
Klein, Arthur, M.D., St. Louis.
Kreiger, John L., M.D., O'Fallon.
Lally, James J., M.D., Kansas City.
Lammert, Thomas K., M.D., St. Louis.
Lapi, Angelo, M.D., Kansas City.
Lowell, Paul, M.D., Kansas City.
Lurie, Harold H., M.D., St. Louis.
Lynxwiler, Chester P., M.D., St. Louis.
McGahan, John J., M.D., St. Louis.
McPike, Lloyd H., M.D., Joplin.
Martin, Frederick W., Jr., M.D., St. Louis.
Otto, Thomas S., M.D., Cape Girardeau.
Peden, Joseph C., Jr., M.D., St. Louis.
Peters, Ann DeHuff, M.D., St. Louis.
Pfeffer, Robert I., M.D., Richmond Heights.
Price, Edward B., Jr., M.D., Kansas City.
Reeder, Charles C., M.D., New Madrid.
Richard, Marion W., M.D., Kansas City.
Ridings, Harold D., M.D., Cape Girardeau.
Schiele, Herbert S., Jr., M.D., St. Louis.
Sorrel, Sydney M., M.D., Jefferson Barracks.
Stahler, John C., M.D., St. Louis.
Turner, Percy C., M.D., Kansas City.
Vinyard, Paul, M.D., St. Louis.
Wacker, John F., M.D., St. Louis.
Williams, Joseph C., Jr., M.D., Kansas City.

DEATHS

McCandless, Oliver H., M.D., Independence, a graduate of the University Medical College of Kansas City, 1901; honor member of the Jackson County Medical Society; retired; aged 75; died May 2.

Bradley, John M., M.D., St. Louis, a graduate of Washington University School of Medicine, 1901; Associate Fellow of the American Medical Association; honor member of the St. Louis Medical Society; retired; aged 79; died May 3.

Kloepper, Victor F., M.D., St. Louis, a graduate of Washington University School of Medicine, 1926; Fellow of the American Medical Association; honor member of the St. Louis Medical Society; aged 51; died May 3.

Taussig, Joseph B., M.D., St. Louis, a graduate of Washington University School of Medicine, 1931; member of the St. Louis Medical Society; aged 47; died May 8.

Viley, Leland P., M.D., Kansas City, a graduate of Washington University School of Medicine, 1908; honor member of the Jackson County Medical Society; retired; aged 68; died June 3.

SOCIETY PROCEEDING

SIXTH COUNCILOR DISTRICT

R. W. KENNEDY, MARSHALL, COUNCILOR

Pettis County Medical Society

The Pettis County Medical Society at a banquet in the Old Missouri Homestead on May 28 honored four Pettis County physicians on their completion of fifty years in the practice of medicine. Honored were Drs. J. E. Cannaday, C. B. Trader and W. T. Bishop, Sedalia, and C. L. Parkhurst, Houstonia. Dr. John B. Carlisle, Sedalia, was master of ceremonies.

A. E. Monroe, M.D., Sedalia, who completed his fifty years of practice in 1943, gave a short talk.

Dr. Carlisle read the following letter sent by the Bothwell Memorial Hospital: "Please convey to Drs. Cannaday, Bishop, Parkhurst and Trader the best wishes of the employes of the John H. Bothwell Memorial Hospital and the board of trustees on their fifty years of practice in the field of medicine.

"Our community has been very fortunate, indeed, to have the services of these outstanding physicians, who have constantly worked to maintain the good health of our citizens. It is with pride that we take this opportunity to express our sincere appreciation for their half century of unselfish service to mankind and their untiring devotion to their profession."

Flowers for the table were the gift of nurses of the hospital.

Carl D. Siegel, M.D., Secretary

WOMAN'S AUXILIARY TO THE MISSOURI STATE MEDICAL ASSOCIATION

President's Message

The Woman's Auxiliary enters its new fiscal year with high aims, great possibilities and a bright future for service to the Auxiliary and the medical profession. What is accomplished during this year depends on the successfulness of plans. Each year the Auxiliary realizes more and more its responsibility.

The spotlight is on the medical profession. Never before has the opportunity been so great to help preserve the "American Way of Life." This can be done only when one has a thorough knowledge of the problems that are before one. May we find the place where we can do the most good to further the aims of our Auxiliary.

The Convention in Kansas City was one to be remembered. This was made possible by the work of the Woman's Auxiliary of Jackson County Medical Society. We want to thank our retiring President, Mrs. Dwight Van Del, for an outstanding piece of work. Our honored guests at the convention were Mrs. Leo Schaefer, National Vice President,

and Mrs. L. S. Thompson, President of the Southern Medical Auxiliary.

Delegates, Alternates and members, remember the date of the Woman's Auxiliary to the American Medical Association which will be held in Atlantic City, June 10 to 15, 1951, with Headquarters at Hotel Haddon Hall.

With the interest shown, the eagerness of service and the willingness to go forward, the Auxiliary activities should reach a new high during the year 1951-1952.

MRS. W. CAREY CHEEK, President.

Officers 1951-1952

President, Mrs. W. Carey Cheek, 1535 E. Meadowmere, Springfield 4.

President-Elect, Mrs. Richard A. Sutter, 7215 Greenway Drive, University City 5.

First Vice President, Mrs. E. E. Wadlow, 2611 Lovers Lane, St. Joseph.

Second Vice President, Mrs. Arnold V. Arms, 6421 High Drive, Kansas City 5.

Third Vice President, Mrs. C. V. Wilcox, 7022 Tholozan, St. Louis 9.

Fourth Vice President, Mrs. W. E. Martin, 403 S. 2nd St., Odessa.

Treasurer, Mrs. Frank Leitz, 6832 Locust, Kansas City 5.

Recording Secretary, Mrs. H. C. Bauman, 921 W. 3rd St., Maryville.

Corresponding Secretary, Mrs. Walter S. Sewell, 1715 S. National, Springfield 4.

Auditor, Mrs. C. Alex McBurney, 927 Hurt St., Slater.

Delegates to the National Auxiliary

Mrs. Richard Sutter, University City.

Mrs. Arnold V. Arms, Kansas City.

Mrs. C. V. Wilcox, St. Louis.

Mrs. W. E. Martin, Odessa.

Mrs. C. Alex McBurney, Slater.

Mrs. Norton J. Eversoll, Ladue.

Mrs. M. D. Grimes, St. Joseph.

Mrs. John O'Connell, Overland.

Mrs. M. Pinson Neal, Columbia.

Mrs. W. L. Allee, Eldon.

Mrs. Dwight T. Van Del, Kansas City.

Mrs. Edward Thiessen, Kansas City.

Mrs. Arthur Altringer, Kansas City.

Mrs. Joseph Fisher, St. Joseph.

Mrs. J. J. Merz, St. Louis.

COUNTY SOCIETY HONOR ROLL—1951

(Societies which have paid dues for all members and date placed on Honor Roll)

Benton County Medical Society—November 28, 1950

Camden County Medical Society—November 29, 1950

Perry County Medical Society—December 6, 1950

Miller County Medical Society—December 8, 1950

Mercer County Medical Society—December 12, 1950

Moniteau County Medical Society—December 16, 1950

Lewis-Clark-Scotland Counties Medical Society—December 20, 1950

Webster County Medical Society—December 20, 1950

Dallas-Hickory-Polk Counties Medical Society—December 28, 1950

Morgan County Medical Society—January 2, 1951

Holt County Medical Society—January 4, 1951

Pike County Medical Society—January 9, 1951

Harrison County Medical Society—January 10, 1951

Audrain County Medical Society—January 18, 1951

Montgomery County Medical Society—January 22, 1951

Pettis County Medical Society—January 23, 1951

Scott County Medical Society—January 24, 1951

Lincoln County Medical Society—January 25, 1951

Henry County Medical Society—January 27, 1951

Howard County Medical Society—February 3, 1951

Stoddard County Medical Society—February 6, 1951

Bates County Medical Society—February 7, 1951

Marion-Ralls Counties Medical Society—February 20, 1951

Callaway County Medical Society—March 15, 1951

South Central Counties Medical Society—March 18, 1951

Ray County Medical Society—April 7, 1951

Newton County Medical Society—April 9, 1951

DeKalb County Medical Society—April 14, 1951

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Terramycin rapidly traverses the placental membrane, and diffuses into the pleural fluid. Large amounts are excreted unchanged in active form in urine and feces, and oral intake markedly alters the intestinal flora.[1,2]



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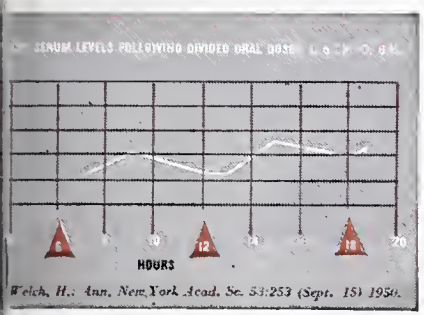
a broad antimicrobial spectrum widens the range of clinical efficacy

Favorable response, described in many instances as "excellent," "good," and "prompt" is recorded for bacteremias caused by pneumococci, staphylococci, and streptococci associated with pneumonia, meningitis, endocarditis, urinary infection, septic arthritis and pneumonitis.[2,4,5,6,7,8,9]
Acute brucellosis, and Bacteroides and E. coli bacteremias have responded favorably,[2,10,11] as have the commonly encountered rickettsioses.[12]

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Crystalline Terramycin Hydrochloride is available as: Capsules, Elixir, Intravenous, Ophthalmic Ointment, Ophthalmic Solution.

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MISSOURI STATE MEDICAL ASSOCIATION

Ninety-Third Annual Session
Municipal Auditorium, Kansas City
April 22, 23, 24, 25, 1951

MINUTES OF THE HOUSE OF DELEGATES

Sunday Session

The first meeting of the House of Delegates of the Ninety-third Annual Session of the Missouri State Medical Association was called to order at 2:00 p.m., April 22, in the Municipal Auditorium, Kansas City, with F. T. H'Doubler, M.D., Springfield, Speaker, presiding.

Officers, Councilors and Delegates present during the Annual Session follow:

Officers

President.....W. A. Bloom, Fayette
President-Elect.....C. Edgar Virden, Kansas City
Secretary.....H. E. Petersen, St. Joseph
Editor.....R. O. Muether, St. Louis
Vice-President.....J. H. Summers, Lebanon
Vice-President.....Joel W. Hardesty, Hannibal
Vice-President.....Carter Luter, Butler

Councilors

1st District.....Donald M. Dowell, Chillicothe
2nd District.....W. F. Francka, Hannibal
3rd District.....J. W. Thompson, St. Louis
4th District.....Otto W. Koch, Clayton
5th District.....J. F. Jolley, Mexico
6th District.....R. W. Kennedy, Marshall
7th District.....Victor B. Buhler, Kansas City
8th District.....W. S. Sewell, Springfield
9th District.....E. Claude Bohrer, West Plains
10th District.....Frank W. Hall, Cape Girardeau

Delegates
First District

Buchanan.....H. W. Carle, St. Joseph
Buchanan.....L. Paul Forgrave, St. Joseph
Buchanan.....O. Earl Whitsell, St. Joseph
Caldwell-Livingston.....Joe Conrad, Chillicothe
Caldwell-Livingston.....Frank Daley, Hamilton
Carroll.....John Platz, Carrollton
Clay.....Earl Knox, North Kansas City
Grundy-Daviess.....W. A. Fuson, Trenton
Grundy-Daviess.....F. K. Wilson, Winston
Harrison.....L. R. Lee, Bethany
Mercer.....C. P. Pickett, Princeton
Nodaway-Atchison-Gentry-Worth.....H. C. Bauman, Maryville
Nodaway-Atchison-Gentry-Worth.....E. D. Imes, Maryville
Nodaway-Atchison-Gentry-Worth.....Frank B. Matteson, Grant City
Ray.....M. L. Masterson, Richmond

Second District

Chariton-Macon-Monroe-Randolph.....Clarence C. Cohrs, Moberly
Lewis-Clark-Scotland.....J. R. Bridges, Kahoka
Linn.....John R. Dixon, Brookfield
Marion-Ralls.....B. L. Murphy, Hannibal
North Central.....J. S. Gashwiler, Novinger
Pike.....John Hooker, Clarksville

Third District

St. Louis City.....Emil A. Burst, St. Louis
St. Louis City.....Delevan Calkins, St. Louis
St. Louis City.....Charles R. Doyle, St. Louis
St. Louis City.....Harry R. Echterhoff, St. Louis
St. Louis City.....Edwin C. Ernst, St. Louis
St. Louis City.....Maxwell Fineberg, St. Louis
St. Louis City.....Armand D. Fries, St. Louis
St. Louis City.....S. Albert Hanser, St. Louis
St. Louis City.....Leo J. Hartnett, St. Louis
St. Louis City.....Charles A. Jost, St. Louis
St. Louis City.....R. Emmet Kane, St. Louis
St. Louis City.....Louis H. Kohler, St. Louis
St. Louis City.....Robert C. McElvain, St. Louis
St. Louis City.....Charles E. Martin, St. Louis
St. Louis City.....Jean J. Merz, St. Louis
St. Louis City.....Robert Mueller, St. Louis
St. Louis City.....Arthur W. Neilson, St. Louis
St. Louis City.....William H. Norton, St. Louis
St. Louis City.....James A. O'Dowd, St. Louis
St. Louis City.....Llewellyn Sale, St. Louis
St. Louis City.....L. R. Sante, St. Louis
St. Louis City.....V. E. Scherman, St. Louis
St. Louis City.....Robert E. Schlueter, St. Louis
St. Louis City.....P. C. Schnoebelen, St. Louis
St. Louis City.....Jerome I. Simon, St. Louis
St. Louis City.....Oliver B. Zeinert, St. Louis

Fourth District

Franklin.....Frank G. Mays, Washington
Jefferson.....R. H. Donnell, Crystal City
Lincoln.....J. C. Creech, Troy
St. Charles.....George E. Kister, St. Charles
St. Louis County.....W. H. Bailey, St. Louis
St. Louis County.....C. P. Dyer, St. Louis
St. Louis County.....F. L. Finley, St. Louis
St. Louis County.....O. P. Hampton, Jr., St. Louis
St. Louis County.....Julius Jensen, St. Louis
St. Louis County.....John O'Connell, St. Louis
St. Louis County.....Lois Wyatt, Kirkwood

Fifth District

Audrain.....T. L. Dwyer, Mexico
Boone.....J. W. Allee, Columbia
Boone.....A. R. McComas, Sturgeon
Callaway.....J. C. Caldwell, Fulton
Cole.....E. R. Bohrer, Jefferson City
Cooper.....B. M. Stuart, Boonville
Howard.....F. D. Dean, Fayette
Moniteau.....J. P. Burke, Jr., California
Morgan.....J. L. Washburn, Versailles
Miller.....W. L. Allee, Eldon

Sixth District

Bates.....C. A. Lusk, Jr., Butler
Benton.....David H. Glenn, Warsaw
Henry.....G. S. Walker, Clinton
Johnson.....T. R. Maxson, Warrensburg
Lafayette.....W. Martin, Odessa
Pettis.....C. G. Stauffacher, Sedalia
Saline.....R. C. Haynes, Marshall
Vernon-Cedar.....C. B. Davis, Nevada
Vernon-Cedar.....John J. Hill, Eldorado Springs

Seventh District

Jackson.....Maxwell G. Berry, Kansas City
Jackson.....Ralph E. Duncan, Kansas City
Jackson.....B. Landis Elliott, Kansas City
Jackson.....Carl R. Ferris, Kansas City
Jackson.....W. Wallace Greene, Kansas City
Jackson.....John A. Growdon, Kansas City
Jackson.....R. Lee Hoffmann, Kansas City
Jackson.....Kenneth C. Hollweg, Kansas City
Jackson.....John S. Knight, Kansas City

Jackson..... A. W. McAlester, III, Kansas City
Jackson..... John H. Mayer, Jr., Kansas City
Jackson..... Wm. C. Schaerrer, Kansas City

Eighth District

Barton-Dade.....H. M. Arnold, Lamar
Dallas-Hickory-Polk.... Doyle McCraw, Bolivar
Dallas-Hickory-Polk.... Evelyn Griffin, Buffalo
Greene.....Durward G. Hall, Springfield
Greene.....F. T. H'Doubler, Springfield
Greene.....A. Denton Vail, Springfield
Jasper.....O. T. Blanke, Joplin
Jasper.....Eugene H. Hamilton, Joplin
Ozarks..... R. R. Farthing, Ozark
Ozarks..... Kenneth Glover, Mt. Vernon
Ozarks.....F. T. Kerr, Monett
Ozarks..... Jesse Threadgill, Forsyth
Ozarks.....Fred Womack, Crane
Webster.....C. R. Macdonnell, Marshfield

Ninth District

Laclede.....J. H. Summers, Lebanon
Phelps-Crawford-Dent-Pulaski.....R. E. Breuer, Rolla
South Central.....C. F. Callihan, West Plains
South Central.....C. W. Cooper, Thayer
South Central.....H. G. Frame, Mountain Grove
South Central.....S. G. Kramer, Houston

Tenth District

Cape Girardeau.....E. D. Campbell, Cape Girardeau
Dunklin.....Paul Baldwin, Kennett
Mineral Area.....B. M. Bull, Ironton
Mineral Area.....H. M. Roebber, Bonne Terre
New Madrid.....John J. Killion, Portageville
Scott..... W. O. Finney, Chaffee

SPEAKER: Members of the House of Delegates, Ladies and Gentlemen, will you please come to order and will you stand while Dr. Earl B. Jewell, St. Andrews Episcopal Church, Kansas City, delivers the invocation?

EARL B. JEWELL, D.D.S.: Almighty God, Who alone gavest us the breath of life, and alone canst keep alive in us the Holy desires Thou dost impart: We beseech Thee, for Thy compassion's sake, to direct our motives, inspire our honest efforts, fill us with unselfish courage, and help us in all our endeavors, as we dare to serve Thee in our ministrations to Thy sick and suffering children. And accept our thanks for those who, cooperating with Thee and Thy laws, have lifted the curtain of ignorance and superstition in the field of therapy and healing. Offered unto Thee is the gratitude of those lives which have been given another chance through the mind, hand and heart of the physician and surgeon. Let Thy Holy Spirit be present in the deliberation of this group of Thy servants, that in all things Thy name and power and glory may be acknowledged. In the name of the Great Physician, Jesus Christ, Our Lord. Amen.

SPEAKER: Thank you, Dr. Jewell. It is now my pleasure to introduce to you Mr. Ilus Davis, who will bring you a welcome to Kansas City from Mayor Kemp.

MR. ILUS DAVIS: Mr. Chairman, Ladies and Gentlemen. If this Association feels badly about not having the Mayor of Kansas City here today, they have only themselves to blame. One of the members of this Association, a Kansas City physician, operated on Mayor Kemp the other day and he was to have been here today. He has a twenty-four hour delay. Therefore, blame yourselves for my presence today.

It is with considerable pleasure that I welcome your group to Kansas City. It is a privilege to welcome professional groups to Kansas City.

A professional group of hotel men met here a short time ago. This hotel convention had had a meeting on Friday night and I was asked to address them on Saturday morning. There was scarcely a noise in the house. It was the coolest reception I had ever received; practically all of them were asleep.

I heard not long ago about a group of psychiatrists that met in New York City, eminent psychiatrists from all over the world. The meeting was going along fine. In the middle of the meeting, a pigeon flew into the room. Now, the remarkable thing about this was that it was two days before a single psychiatrist would admit that he saw a bird in the room.

I hope you all have a good time while here in Kansas City. We are proud of our medical profession and our hospitals. One dollar out of every five collected is spent on city hospitals. We realize that our doctors have contributed to the success of the hospitals. We are happy at the City Hall to see more money spent each year on our city hospitals and to see the medical profession making such wonderful strides in this area. We have come out strong for a medical school in the State of Missouri. As voters of the tenth largest state, we need a medical school of our State University. The city government of Kansas City stands behind this need and will do everything possible that we can to its success.

I am glad to see all of you here in Kansas City. Take a few minutes off to see the sights in Kansas City and the things of which we are so proud.

SPEAKER: Thank you, Mr. Davis. Will the Chairman of the Committee on Credentials, Dr. Dean, please make his report.

FRANCIS D. DEAN, M.D., Fayette: Mr. Speaker, the Committee on Credentials reports seventy-two Delegates, ten Councilors and four Officers registered.

SPEAKER: The next order of business is the roll call. Mr. O'Brien, will you call the roll?

Mr. T. R. O'Brien read the roll of delegates and alternates, which showed a quorum present.

SPEAKER: I will ask for the report of the General Committee on Arrangements, Dr. Buhler.

VICTOR B. BUHLER, M.D., Kansas City: You have been welcomed by a representative of Mayor Kemp and I would like to issue a welcome in behalf of the Jackson County Medical Society. Enjoy yourselves while here in Kansas City. The Program Committee has had excellent cooperation from all, especially those who have been involved with television. The program to be presented, I believe, will speak for itself. We have tried to make everything as easy as possible so you can enjoy your stay while in Kansas City.

SPEAKER: Thank you Dr. Buhler. The next order of business is the reading of the minutes of the previous meeting. They were published in the July 1950 issue of THE JOURNAL. What is your pleasure?

Upon motion, duly seconded, the minutes were approved as published.

VICTOR E. SCHERMAN, M.D., St. Louis, Vice Speaker, presiding, the Speaker spoke as follows:

Organized medicine has gotten into gear and is doing a splendid job of fighting state medicine. We have excellent Public Relations men who are doing their work wonderfully well in building up a better understanding between the public and organized medicine and in bringing pressure to bear where it will do the most good in opposing undesirable legislation.

However, the Administration and the other proponents of a welfare state are slyly tacking little and big welfare schemes onto acceptable war measures that seem themselves necessary and urgent. We must be on our guard. Each of us must vote discriminatingly—regardless of party lines—for nominees known to be fair

toward our organization and by all means against those known to favor state medicine. We must talk the question over with our patients and other friends—urging them to help carry on the fight by likewise voting discriminatingly and influencing others to do the same. Every layman today is strong for some one doctor but toward organized medicine he is apt at the same time to be cynical and skeptical and perhaps hostile. We have allowed this feeling to develop—because while our adversaries have been busy at propaganda we have blithely ignored the situation, feeling that we are too busy to do otherwise—taking good care of our patients and keeping abreast of progress. If each of us will only work intimately among his patients and other friends we can build up a broad front which might be a decisive factor—not to belittle in any way the big work that organized medicine as a body is doing.

We must police ourselves as to unfair fees—as to availability for night and other emergency calls and such things. With the present trend even little irregularities—or maybe what are not really irregularities but outwardly seem to be such—are seized upon and are made out to be dreadful situations. They are in addition to being undesirable in themselves food for adverse propaganda.

To sum up—we have to work individually as well as an organization to defeat state medicine.

The Speaker appointed the following Reference Committees:

Reference Committee on Amendments to the Constitution and By-Laws

A. Denton Vail, Springfield, Chairman.
J. L. Washburn, Versailles.
P. C. Schnoebelen, St. Louis.

Reference Committee on Resolutions

Durward G. Hall, Springfield, Chairman.
Ralph E. Duncan, Kansas City.
Jerome I. Simon, St. Louis.

Reference Committee on Miscellaneous Affairs

W. O. Finney, Chaffee, Chairman.
O. P. Hampton, St. Louis.
P. W. Jennings, Canton.

Reference Committee on Medical Education and Public Welfare

R. C. Haynes, Marshall, Chairman.
J. H. Summers, Lebanon.
Henry C. Bauman, Maryville.

Reference Committee on Reports of Officers

R. Lee Hoffmann, Kansas City, Chairman.
E. H. Hamilton, Joplin.
Horace W. Carle, St. Joseph.

Reference Committee on Technical Exhibits

Kenneth Glover, Mount Vernon, Chairman.
Lois C. Wyatt, Kirkwood.
Maxwell G. Berry, Kansas City.

Reference Committee on Scientific Exhibits

E. R. Bohrer, Jefferson City, Chairman.
George E. Kister, St. Charles.
Ben M. Bull, Ironton.
H. M. Roebber, Bonne Terre.

W. A. Bloom, M.D., Fayette, gave the President's Message as follows:

President's Message

Mr. Speaker, Members of the House of Delegates: It is hard for me to realize, as I stand before you this afternoon, that an entire year has gone by since I last addressed this House of Delegates at the start of my term of office as President of the Missouri State Medical Association. At that time, I was conscious of the heavy responsibility that awaited me and of the magnitude of the job that lay ahead. Today I am astonished when I think how quickly the last year has gone by, when I reflect on how much there was to do and how little time there seemed to be for doing it.

Before giving you a brief and summary account of my stewardship as your President in these last months, however, I cannot but recall that Wally Smith a year ago stood where I stand now. He reported to you then as retiring President of our Association. More important, I believe, he reported to you as a long and faithful worker for our profession in Missouri. And still more important, he reported to you as a friend.

I am certain there are many of you in this audience who share with me a deep sense of personal loss at the recent death of our associate of so many years. To the older doctors of Missouri, Wallis, I am certain, stood for all that was best in the tradition of service and of fellowship that has marked the whole place of our Association in the life of the state. To the younger men who may perhaps not have known him personally, I can say only that in his death the medical profession of Missouri—and, indeed, the people of the state—lost a spirited champion for their best interest and, more than that, lost a good friend.

As I stand today to report to you at the end of my brief twelve months of office, I am conscious, as the prayer book says, of the things I have done that I ought not to have done and even more conscious of the things I have left undone that I should have accomplished. In extenuation, I can say only that the job I undertook was a big one and to it I have given my best effort.

Looking back on the year, there are a number of things to which I wish to refer with particular emphasis. But first, in a general way, I should like to call your attention to the printed reports of officers and committees of your Association for the last year. I do not know how it will seem to you, but to me reading these reports was a revelation. Here I found altogether —all in one place—the full record of the organized work of the doctors of Missouri throughout an entire year in the interests of the people of our state. To me the record is an inspiration. I am happy to have the satisfaction of knowing that so much in the true interest of our state has been accomplished by our profession in the last year.

At this time, I want to extend to every officer, to the members of the Council and to the staff of Missouri State Medical Association my heartfelt thanks for their conscientious work and measurable achievements in the months past. At the same time, I want to express again to my associates in Fayette my gratitude for their patience and forebearance in circumstances which caused me to be absent for frequent and extended periods from our work together.

Turning now to particular developments of the year past, it seems to me important to emphasize for the record a number of forward steps in which this association had a part. These steps toward better health for our entire state are the sort of thing for which our Association exists and are the justification for giving to its work the time and energy and effort that so many doctors devote to Missouri State Medical Association.

In measuring the progress of the last year, I think it best to break the material down into its relation to particular problems confronting the people of Missouri.

The first of these problems—and, perhaps, the most pressing—is the problem of facilities for health care in rural areas. The last year has seen continuation of

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Literature on Request

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our steady progress in solving this problem. First, I wish to call attention to the work of our Committee on Scientific and Postgraduate work, which throughout the year sponsored so many splendid meetings that carried to our outstate physicians important new medical knoweldge for the better serving of the people. Our meeting here at Kansas City, with its outstanding program, is a further impressive tribute to the effective work of this Committee.

It would take much too long for me to comment particularly on the excellent work of each of the committees, and I shall not attempt to do so, but, in this brief two sentence digression, I wish emphatically to state how conscious I am of the good work done and how much I believe the whole Association is indebted to the men who worked as chairmen and as committee members.

Returning now specifically to progress in the field of rural health, I think we may all take great satisfaction in the completion of four new hospitals in outstate Missouri. These much needed facilities were made possible by funds partially provided by the Hill-Burton Hospital Construction Act and by the work of member doctors of this Association.

The year saw further impressive gains in the providing of physicians in outstate areas. An additional fifty-eight doctors began practice in rural Missouri during the year, bringing the total of new physicians outstate since January 1, 1946, to more than 400. Our Association has had a great part in this impressive progress toward a better distribution of doctors throughout the state.

At the same time, we have continued to work diligently for the establishment of a four-year medical school as part of the University of Missouri. We have endeavored to present to the public what we conceive to be the best practical solution of problems relating to the school. I am hopeful that the coming year will see the final solution of all these problems and the establishment of this much needed additional facility under circumstances that will make possible its economical and effective operation in the best interests of all the people of the state.

The second major area of activity on which I wish to comment is in the field of medical economics. Here, too, impressive progress has been made during the last year. All of us, I believe, recognize that the medical profession must provide leadership in establishing sound prepayment insurance on a voluntary basis. If voluntary insurance does not do the job, we may be certain we shall face continuing threats of compulsory health insurance and socialized medicine.

It seems to me the record in Missouri in this connection for the last year is most encouraging. Our doctor-sponsored hospital care plans showed during the year 1950 a gain in enrollment of 114,135, bringing the total number of persons protected in the state to 1,347,756. An even more impressive percentage gain was recorded in the Blue Shield medical service plans also sponsored by organized medicine. Here the state gain was 114,194, bringing the total to 570,695. I think it should be noted in passing that in addition to all the hundreds of thousands of Missourians protected under doctor-sponsored plans, there are many, many more thousands who have protection under a number of excellent private insurance company programs.

A third achievement of the last year that seems to me particularly impressive is the splendid work done by the members of our Committee on Emergency Medical Service. The doctors of Missouri are ready with their developed plan for providing emergency medical service in the event of an atomic disaster. I think it perfectly fair to say that in this field the medical profession of Missouri is far ahead of the governmental agencies of the state. We have done our own thinking. We have blazed a trail, and we are ready to serve if needed.

Though I do not wish to dwell on the work of individual committees, as I have indicated already, I cannot forbear to say that in many areas of health care and in many problems of particular diseases the doctors of this Association have been voluntarily active in the last year and have made substantial contributions to the solving of many problems important to the welfare of all Missourians. You will find these contributions summarized in your booklet of committee reports.

And, now, I believe it is time for me to conclude this talk, though, frankly, I should like to carry it on a good bit longer. There are many names I should like to mention; there are many achievements I should like to dwell on. I have, however, already used up my full allotment of your attention.

Before concluding, I should like to recommend to the House one definite and practical change in our procedure for next year. I believe the deliberations of the House of Delegates would be much simplified and the effectiveness of our annual sessions much increased if the texts of all resolutions to be submitted to the House could be submitted well in advance. I think it would be helpful if the texts of such resolutions were printed with the reports of committees so that every member of the House might have an opportunity to study them and reflect upon them before the meeting. I believe such a step would contribute importantly to wise decisions by this House made after thorough and adequate reflection.

And now, before concluding, I want once more to express my thanks to all the officers, councilors and committee chairmen of the Association who have done so much to make my year as President a happy and effective one. I want particularly to express my thanks to Tom O'Brien and to Ray McIntyre and Helen Penn. Throughout the year the personal interest and real devotion to the job in hand which all those in our state office have shown have convinced me that we doctors of Missouri are lucky in having so able and so dedicated a group to serve us.

I have enjoyed my year as President. I thank you for it. I extend my best wishes to Spike Virden, my successor, and an offer to all of you to help in any way I can in carrying forward the program of our Association.

C. Edgar Virden, M.D., Kansas City, gave the Recommendations of the President-Elect as follows:

Recommendations of President-Elect

Mr. Speaker, Members of the House of Delegates of the Missouri State Medical Association: If it were possible I would like nothing better this afternoon than to trade places with Dr. Bill Bloom and be able to deliver to you a report on the activities of our Association in the year just passed, rather than to speak of the program of the year ahead. I know you all join me in extending to Dr. Bloom congratulations for the fine way he has conducted the affairs of his office; my only wish is that my own term of office may be concluded with an equally successful record.

My task, however, is not to look back but to look ahead. This, of course, is much more difficult, hindsight always having been easier than foresight. Somehow in these utterly confused times, the future seems to present greater and greater complexities, and the months ahead of us seem to defy any confident prediction or solution of our problems. It seems reasonably certain, however, that the demands upon our Association and all members of the medical profession will be greater than any we have known before. The present uncertainties have added greatly to our responsibilities. With the possibility of war we must continue to plan for disaster as we have so brilliantly begun under the guidance of

Dr. Carroll Hungate. We must be ready to provide emergency medical service to the people of our state. I do not know whether atomic assault on the United States is probable; I do know that it is sufficiently possible that our Association must continue our efforts to organize the people of Missouri to be ready for such an attack if it should occur.

Even if we do not have war, the continuing international tension demands that America be ready for such a possibility. This alone will add to the burdens of the medical profession as we must make our contribution to the medical services of our armed forces and still continue to care for the health of those who must remain at home. In this connection, I wish to emphasize the importance of the organized medical profession continuing to work out a practical intelligent plan devised to meet this load of responsibility. It is time for the doctors of Missouri to lay aside personal and factual interests and to do their part to cooperate in the military and civilian mobilization confronting us.

Aside from the national emergency, our Association continues to have many problems of great importance not only to doctors but to all the people of the state. We shall need to draw on all our perserverance and patience if we are to solve them.

And for a moment I should like to digress to discuss one or two of these points with you which we doctors have sometimes overlooked.

Often we are confronted with a paradox. In all of the medical activities in the public interests and our sponsorship of activities in the interests of health, we feel we are motivated by the most unselfish intentions and concerned entirely with the welfare of the public. As medical men we believe, and I think quite rightly, that we are in the best position to judge the needs of the people in the field of medicine. At the same time, however, we are not infrequently confronted with opposition that is difficult for us to understand. This opposition comes from many sources, including the press, and not infrequently from politics and from well intentioned groups who sincerely, but it seems to us often mistakenly, wish to do things differently from the way that appears to us to be right. This, however, should not deter us from continuing to press for those things which we believe to be right in the field of health. However, it is unreasonable to expect that there will be no opposition and we will always be listened to as experts and to consider that no one else has any voice in the development of health plans and care.

The task before us is, as it has been in the past, to win through to our objectives in a democratic way; to overcome opposition and political expediency by proving that our answer to health questions is that which fits in best with the public need and interest.

No one can quarrel with the record of achievement of the medical profession; it is a glorious and thrilling record, all made possible by the cooperation of the medical profession with all the other allied professions and the public health and sanitation programs. We have strong ground to stand on and our task now is simply to try to make the people understand that all this has been accomplished by our institutions of freedom in medicine, and that the future orderly development of medical care should not be strangled by ill advised political planning.

And now I believe it is time to come back to a discussion of some of the phases of the program which I hope our state will pursue in the year ahead.

The first element of this program for the next twelve months is, as I conceive it, a continued effort to establish a four-year medical school under the jurisdiction of our State University; if possible, patterned after and directed toward the development of an overall medical educational plan similar to that which has been achieved and is continuing to develop in our neighboring State of Kansas. The need for this school has been demonstrated beyond all question, and we are deeply indebted to Dr. Glen Hendren of Liberty, Missouri, who has spent much time and effort trying to clarify the essentials of the problem of establishing this school in a way that will enable it to serve all the people of the state to the best advantage. We are cognizant of the recent action of the Board of Curators of the University of Missouri, regarding the establishment of this school; we shall continue to press for further consideration of the viewpoints of the Missouri State Medical Association previously expressed and a matter of record, to build a better medical school with lesser tax burden on the people of Missouri with money left to provide better medical facilities for all the people of our state, particularly those in rural areas. Many of our programs are devoted to this end, the importance of which we all agree. At this time I believe all I need to say is that these programs should continue to have the fullest support the Association can give them. I might add, however, in regard to rural areas that one of the most important things is the development of local health councils at county levels with cooperation and representation of all parties concerned.

Next, I would like to discuss the opportunity which we now have to demonstrate that our voluntary health insurance plans, whether they be Blue Cross, Blue Shield or commercial in type, can provide the people of our state with a practical and effective means of protection against the economic shock of illness. These plans have aroused the opposition and even the ridicule of some people highly placed in government, but to me they appear to be working out beyond our expectations. We admit that they are not perfect, but I believe that everything our Association can do to foster increased enrollment in these programs, and everything that we can do to improve these programs should have a place of high priority in our efforts. I regret having to do so, but I must remind you that we must be continually alert against the onslaughts of those who would socialize, and there is no other name for it, the practice of medicine. We should not be lulled into a sense of false security by our recent success combating adverse legislation. Men backing these measures have not ceased their efforts, and innumerable bills have been introduced which, if adopted, would socialize the practice of medicine piecemeal just as surely as would the Wagner-Murray-Dingell bill, had it been passed. It therefore behooves us to continue our interest in the actions of our legislators and the administrators of the various bureaus, locally and nationally. I believe that many of us should join the American Association of Physicians and Surgeons as this body has been most active in combating the socialistic trends so evident in much of the proposed legislation pertaining to medicine. Do not misunderstand —all legislation is not bad—but any further enroachment of government in the field of medicine should be by agreement between government and the medical profession, and not from political propaganda.

Finally, I believe that through our journals and through our committees on postgraduate and scientific work, we must continue to provide the means of bringing to all the doctors of Missouri continued information on new developments in scientific medicine. I am particularly impressed with the program of our Annual Session in this connection, and I extend to Drs. Buhler and Coffey, and all the members of their committees, my congratulations for the magnificent job they have done.

Thus, I hope I have expressed to you some of the objectives that seem important to me as we look toward the year ahead. I hope that the end of this ensuing year will see some real accomplishment, but I have

lived far too long not to expect that there will be some disappointments. If we just arrive at the end of the year knowing that we have pursued our program in a way that will win for us a greater acceptance and understanding on the part of the general public, we should be content. I sincerely hope we will have the knowledge and satisfaction of knowing that each and everyone of us has done his part in the important things that we must do for our nation, our state, our friends, our neighbors.

The report of the Secretary, H. E. Petersen, M.D., St. Joseph, follows:

REPORT OF THE SECRETARY

On December 31, 1950, the official membership of the Association was 3,548.

STATUS OF MEMBERSHIP

Number of members, January 1, 1950		3,497
New members	235	
Reinstated	8	
Total		3,740
Dropped	42	
Deceased	88	
Transferred	62	
Total		3,548

Of this number 330 are Honor Members.

The Committee on Nominations which is appointed by the President from the House of Delegates must submit nominations for the following offices:

Three Vice Presidents to fill the vacancies created by the expiration of the terms of J. H. Summers, M.D., Lebanon; Joel W. Hardesty, M.D., Hannibal, and Carter Luter, M.D., Butler.

Two Delegates and corresponding Alternates to the American Medical Association to fill the vacancies created by the expiration on December 31, 1951, of the terms of R. E. Schlueter, M.D., St. Louis; alternate, F. G. Pernoud, M.D., St. Louis; and James R. McVay, M.D., Kansas City; alternate, R. B. Wray, M.D., Nevada.

The terms (two years) of the Councilors of the even numbered districts expire this year: W. F. Francka, M.D., Hannibal, Second District; Otto W. Koch, M.D., Clayton, Fourth District; R. W. Kennedy, M.D., Marshall, Sixth District; W. S. Sewell, M.D., Springfield, Eighth District; Frank W. Hall, M.D., Cape Girardeau, Tenth District. Delegates from these districts shall meet on the third day and elect the Councilor for their district. The election shall be certified to the House of Delegates on a prescribed form which will be furnished. Lists of delegates from the various districts will be available to the Councilors at the Registration Desk.

The Session will convene for four days beginning Sunday, April 22, at 2:00 p. m., with a session of the House of Delegates, and closing Wednesday afternoon, April 25. A recessed session of the House of Delegates will be held Monday, April 23, at 4:00 p. m. and the final session of the House will convene at 2:00 p. m. on April 25. There will be a dinner for Presidents, Secretaries and Editors of County Societies on Sunday, April 22. The Annual Banquet in Honor of Past Presidents will take place on Monday evening, April 23, at 7:30 p. m. at Hotel President.

H. E. Petersen, Secretary.

The report of the Executive Secretary, Mr. T. R. O'Brien, follows:

REPORT OF THE EXECUTIVE SECRETARY

The year 1950 proved to be an outstanding one in the history of the Association. The Annual Session last March was one that will long be remembered by those who attended. Many outstanding events arranged especially because of the Centennial of the Association were enjoyed by all. Especially noteworthy was the "History of the Association" written by Robert E. Schlueter, M.D., St. Louis. The showing of color television of operations and medical clinics for the first time in St. Louis proved to be popular with all who were there.

It is hoped that the Annual Session in 1951 will be as well attended and as well received as the one in 1950. Special efforts have been made by the Committee on Scientific and Postgraduate Work to present a scientific program of practical value to the members. Color television will be sponsored again by the Philadelphia pharmaceutical house, Smith, Kline and French Laboratories. This will be the first showing of color television in Kansas City. Scientific and technical exhibits will bring information about the latest technics and advances in medicine. Members are urged to visit the Technical Exhibits during the intermission periods provided for that purpose. Revenue received from the sale of Technical Exhibit space helps to make the meeting a success.

The Committee reports outline many of the activities of the Association as well as providing duties for the Executive Secretary and Field Secretary. Either Mr. McIntyre or I attend all committee meetings and endeavor to carry out the wishes of the House of Delegates, Officers, Councilors and Committees.

I wish to take this opportunity to thank the other members of the Association staff, Ray McIntyre, Helen Penn, Mrs. Bertha Thomas, Mrs. Katherine Burnett and Mrs. Gloria Luecke for the fine cooperation and assistance rendered. You have in these able people a group which is devoted to your interests and projects.

T. R. O'Brien.

Mr. O'Brien: The following honor members are eligible for Associate Fellowship in the American Medical Association: Drs. Carl A. Powell, Jefferson City; Walter D. Pipkin, Monroe City; U. S. Smith, Hannibal; George M. Polk, Lee's Summit; John C. Starks, Gower; Henry S. Brookes, Webster Groves; Eugene A. Miller, St. Joseph; Jesse N. Hill, Independence; William D. Black, H. M. Foster, Roy P. Scholz, A. G. Schlosstein, Ealter P. Eidmann and W. E. Sauer, St. Louis; Virgil W. McCarty, and Abraham Sophian, Kansas City.

Upon motion, these members were approved for submission to the House of Delegates of the American Medical Association for Associate Fellowship.

The report of the Treasurer, C. E. Hyndman, M.D., St. Louis, follows:

REPORT OF THE TREASURER

The report of the Treasurer is covered in the Financial Statement of the Association for 1950 which appeared in the April issue of The Journal. Since Delegates have had that issue of The Journal, the report is not repeated in these reports but Delegates are referred to The Journal.

C. E. Hyndman, Treasurer.

Upon motion these reports were referred to the Reference Committee on Reports of Officers.

Upon motion, duly seconded, the Speaker was authorized to refer all reports to the appropriate reference committee.

The report of the Committee on Scientific and Postgraduate Work, Victor B. Buhler, M.D., Kansas City, Chairman, follows:

REPORT OF THE COMMITTEE ON SCIENTIFIC AND POSTGRADUATE WORK

At the 1950 Annual Session, the House of Delegates approved a by-law which combined the former com-



Two of these physicians suspected the worst...

but not until the significance and the incidence of amebiasis were thoroughly revealed at a hospital staff meeting. This meeting was held in a large city well north of the Mason-Dixon line, hardly a "tropical" climate, yet the incidence was high.*

The two staff men recognized that the symptom pattern of amebic dysentery fitted their experience of several months past and stool examination revealed that they, too, had amebiasis. A course of treatment for these physicians with Milibis-Aralen was completely successful.

Milibis — bismuth glycolylarsanilate — has given excellent results in thousands of cases. In 82.6% of patients followed parasitologically for prolonged periods, negative stools were obtained consistently after 1 to 4 courses of Milibis.

Because intestinal amebiasis may be complicated by extra-intestinal involvement, it is recommended that Aralen (chloroquine) diphosphate be employed in addition to Milibis for the treatment of all cases of amebic infection.

Illustrated booklet available on request.

HOW SUPPLIED:
Milibis, tablets of 0.5 Gm., bottles of 25;
Aralen, tablets of 0.25 Gm., bottles of 100.

***MILIBIS*®** *amebacide...high in potency...low in side effects*

***ARALEN*®** *...for extra-intestinal amebiasis*

Winthrop-Stearns INC 1450 BROADWAY, NEW YORK 18, N. Y.

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*Towse, R. C., Berberian, D. A., and Dennis, E. W.: *New York State Jour. Med.*, 50:2035, Sept., 1950.

mittees on Postgraduate Course and Scientific Work. Therefore, the Committee this year has carried on the combined functions of the two former committees.

The Committee has been glad to fulfill requests for speakers for the programs of numerous societies. Programs also were arranged for afternoon and evening Councilor District meetings in Districts 1, 2, 5, 6, 8, 9 and 10; for evening District dinner meetings in Districts 2, 4, 6, 8 and 9; for joint societies' evening dinner meetings in Chillicothe, Wentzville and at the Yacht Club on Lake Lotawana, Jackson County. The afternoon programs of the Councilor District meetings were arranged in cooperation with the Cardiovascular Section of St. Louis University School of Medicine and the Missouri Division of Health.

Seventy-six speakers for scientific programs of various meetings over the state have been furnished by the Committee since the 1950 Annual Session.

The Committee takes this means to compliment the County Societies who plan and secure their own programs for their fine efforts in making available to their members well planned scientific presentations.

No Councilor District meetings were held in Districts 3 and 7. It is felt that the two largest cities in the state have ample regular scheduled medical meetings to satisfy the desire of most of the members in those districts.

Additional postgraduate programs which attracted many physicians were the Third Annual Clay County Medical Society Clinical Conference held in Excelsior Springs November 2; the Annual Meeting of the St. Joseph Clinical Society held in St. Joseph on October 19; a six session postgraduate course December 1950 through May 1951 in St. Joseph sponsored by the Buchanan County Medical Society in cooperation with the University of Kansas Medical School and the Missouri Academy of General Practice; a series of four postgraduate evening meetings during the fall months at Nevada, Sedalia, Chillicothe, Springfield, Jefferson City, Hannibal and Sikeston sponsored by the Missouri Academy of General Practice in cooperation with the medical schools of Washington University, St. Louis University, University of Missouri and the University of Kansas.

This Committee, through the headquarters office, is attempting to coordinate postgraduate work being offered by various organizations and groups in the state to eliminate as much as possible conflicting meeting dates and duplication of programs.

The Committee is appreciative of its indebtedness to the many physicians who have cooperated in this endeavor to promote postgraduate medical work in the state.

The Committee has arranged a program for the 1951 Annual Session which it believes will be valuable to members and guests. The speakers selected are outstanding in their fields. Color television again has been arranged and surgical procedures and medical clinics will be shown on television screens at the Auditorium while being performed at General Hospital No. 1.

Victor B. Buhler, Chairman,
H. E. Petersen,
Guy D. Callaway,
A. N. Arneson,
M. Pinson Neal.

The report of the Committee on Publication, R. O. Muether, M.D., St. Louis, Chairman, follows:

REPORT OF THE COMMITTEE ON PUBLICATION

January 1, 1950, to January 1, 1951

The 47th volume of The Journal was completed with the December 1950 issue. During 1950 there were published in The Journal forty-two original articles, eleven postgraduate reviews, twelve clinical pathologic conferences, fifteen case reports, twenty-eight editorials, one hundred thirty-one news items, twelve reports by the Field Secretary, twelve President's pages, ninety-two obituaries, thirty-four miscellaneous articles, forty-three society proceedings, twelve organization activities articles, one legislative article, two reports from the Woman's Auxiliary and sixteen book reviews. There were 546 pages of reading material and 414 pages of advertising.

Advertising in The Journal from January 1, 1950, to January 1, 1951, earned $19,642.06. Subscriptions of nonmembers amounted to $151.00, making $19,793.06 earned by The Journal. The cost of production of The Journal (printing and illustrations) was $16,953.70.

R. O. Muether, Chairman,
V. T. Williams,
H. E. Petersen,
M. D. Overholser,
Paul O. Hagemann.

The report of the Committee on Public Policy and Public Relations, Armand D. Fries, M.D., St. Louis, Chairman, follows:

REPORT OF THE COMMITTEE ON PUBLIC POLICY AND PUBLIC RELATIONS

I. PUBLIC RELATIONS ACTIVITY

During the year, the Committee, largely through its Chairman, kept in close touch with the public relations work of the Association by attendance at meetings of the Council and by continuous contact with the state office and with the public relations agency.

The detailed record of public relations projects, news and publicity materials, speeches and such is contained in two books filed with this report. One of these presents the full account of public relations activity in connection with the Centennial Meeting last spring in St. Louis. The other contains the day-to-day record of the year's work in public relations and publicity.

During the year, the Chairman of the Committee kept in touch with national developments of interest to the Association in the field of public relations. This involved frequent correspondence with the office of Dr. Lawrence in Washington on various aspects of proposed national legislation. The Chairman also corresponded with Sen. Thomas Hennings, Jr., in regard to his position on Compulsory Health Insurance.

Early in December of 1950, the Chairman attended the American Medical Association public relations conference in Cleveland, at which many questions of medical public relations were reviewed. Numbers of projects in this field were discussed—some of them of present or potential interest to the Missouri State Medical Association. Among these topics were the following:

1. Adequate night and emergency call system.
2. State grievance committee.
3. Doctors' leadership in solving their community health problems and bettering existing local health facilities.
4. Promotion of voluntary insurance plans and efforts to make sure that those who need medical care do not hesitate to seek it for financial reasons.
5. Lay participation on public health committees.
6. Recruiting of qualified people for medical and allied fields.
7. Educational activities such as Toledo doctors' publication of a booklet, "Getting Well at Home."

II. COSTS

During the year, a monthly fee of $250 for professional public relations service was paid by the Association. An extra cost amounting to approximately $450 was incurred for the intensive publicity work involved in the Centennial Meeting. Costs for processing materials, postage, travel and expenses of the public rela-

tions agency and Committee totaled approximately $24.00 a month.

It is interesting to compare Missouri State Medical Association expenditures in the public relations field with those of other state associations. The Committee has made a survey of public relations activities and expenditures of state medical associations, the results of which are summarized below:

1. Range of membership: 141 to 22,975.

2. Range of annual dues: $15 to $75. Following is a schedule of state societies' dues:

$15—(6) Georgia, Kentucky, Mississippi, Missouri, Ohio, West Virginia.

$20—(5) Alabama, Arkansas, Illinois, New York, South Carolina.

$23—(1) Pennsylvania.

$25—(7) Delaware, Louisiana, New Jersey, Tennessee, Utah, Virginia, Wyoming.

$30—(4) Idaho, Minnesota, Nebraska, New Mexico.

$35—(6) Indiana, Maine, Massachusetts, Texas, Vermont, Washington.

$40—(7) California, Colorado, District of Columbia, Florida, New Hampshire, North Carolina, Rhode Island.

$42—(1) Oklahoma.

$45—(1) Michigan.

$50—(6) Arizona, Iowa, Montana, North Dakota, South Dakota, Wisconsin.

$75—(1) Nevada.

3. Assessments: Indiana, $25; West Virginia, $10.

4. Expenditures for public relations: From 10 per cent to 67 per cent, or from $787 to $140,800.

The average percentage of state medical association expenditures for public relations is 28.6; the maximum expenditure is that of the Michigan State Society in the amount of $140,800 or 61 per cent. Other large expenditures in the field are those of New York ($68,400, 15 per cent); Texas ($58,000, 27 per cent); Pennsylvania ($40,000, 17 per cent); Minnesota ($30,000, 30 per cent); North Carolina ($28,000, 28 per cent); Washington ($25,000, 32 per cent); Ohio ($21,600, 19 per cent); Tennessee ($20,000, 36 per cent).

5. Thirty-five societies remit dues of members in military service, nine do not.

It will be recognized that the public relations budget of the Missouri State Medical Association is a modest one. On the experience of the last year, however, it appears a realistic sum for the Association to spend in the field of public relations, particularly at the present time when no particular problem is of immediate and pressing urgency and when the return of numbers of doctors to military service may be expected to reduce in some degree the income of the Association.

III. RECOMMENDATIONS

The Committee recommends that for the time being the public relations program be continued on its present modest and realistic basis.

It will be recalled that the Committee last year blueprinted a complete and detailed public relations plan. The central part of the plan was to designate doctors to be public relations spokesmen for every county society. These county representatives were to be members of a councilor district public relations committee, and the chairmen of the district committees were to be the overall state committee. The plan called for a channeling out of information through this network so that every local society would have an informed and ready spokesman to represent it before the public and the press.

In view of present circumstances in Missouri, however, the Committee thinks it desirable at this time to recede from this intended plan of public relations, which has not been carried beyond the blueprint stage. Most doctors, it is believed, are receiving the information they need and want on most major issues from the state office, from Whitaker and Baxter, from Dr. Lawrence's office and, in particular cases, from the public relations agency.

There has been no evidence that doctors at this time wish to work as volunteer public relations men. When a meeting of the planning committee was called in January a year ago in Jefferson City, attendance was most disappointing.

In view, then, of the present state of the public relations problem, of the budget and of doctor interest, it is recommended that the public relations activity be continued on the same level of limited and practical service to meet needs such as have occurred during the last year. In practice, this arrangement has served the Association well and at minimum cost.

In such an arrangement there does not seem to be a logical place for a separate committee on public policy and public relations. In practice, the public policies of the Association are determined by the Council. Also, in practice, the day-to-day public relations activities that carry out the policies of the Council are handled by the state office, to which our professional public relations agency reports just as if it were a unit of the Association staff. If the program is to remain on its present practical and modest basis, the Committee feels that the working arrangement now in effect should be recognized and that the present Committee structure should be altered to reflect the actual realities. Therefore it is recommended that by a change in the by-laws of the Association, the Committee on Public Policy and Public Relations be reconstituted as a subcommittee of the Council so that the responsibility of the Council, as such, for public policy will be fully recognized. (The Chairman of the Council or a Councilor designated by him would be chairman of this subcommittee.) It is recommended further that the responsibility for day-to-day public relations work be recognized as a function of the state office, under the Council's subcommittee, and that the office continue to do the daily work, as it has actually been doing, making use of and directing the public relations agency as may seem expedient in getting the necessary job done.

The effect of these recommendations would be to maintain the public relations set-up on a modest and realistic basis and at the same time to provide a flexible and valuable service facility for all officers of the Association and all committee chairmen to call on when and as they wish. The worth of such service has proved itself during the last year.

ARMAND D. FRIES, Chairman,
J. W. ALLEE,
F. R. CROUCH,
HOWARD B. GOODRICH,
JOHN GROWDON.

The report of the Committee on Defense, C. E. Hyndman, M.D., St. Louis, Chairman, follows:

REPORT OF THE COMMITTEE ON DEFENSE

MARCH 1, 1950, TO APRIL 1, 1951

Cases pending March 1, 1950	3
New cases during the year	1
Cases settled during the year	1
Cases pending April 1, 1950	3

The one case that was settled was handled by the physician's insurance company and was settled for $1,000.00.

C. E. HYNDMAN, Chairman,
ROLAND S. KIEFFER,
JAMES H. O'NEIL,
O. B. ZEINERT,
L. P. FORGRAVE.

The report of the Committee on Medical Education and Hospitals, John S. Knight, M.D., Kansas City, Chairman, follows:

REPORT OF THE COMMITTEE ON MEDICAL EDUCATION AND HOSPITALS

There has been much activity of interest to the Committee on Medical Education and Hospitals in the last year.

The need of a four year medical school as a part of the University of Missouri is now completely recognized by all as an obligation. Thorough study detailing the advantages and disadvantages of location with its attending requirements of staff, facilities and budget has been made by Harold S. Diehl, M.D., Dean of Medical Sciences, University of Minnesota, at the request of the Board of Curators. Majority and minority reports of the special committee of the Board of Curators have been made and published. Several bills advocating various locations of the school have been introduced to the State Legislature. None of these bills had been perfected.

The Committee again wishes to go on record in support of the six point program that has been approved previously by the House of Delegates.

Four hospitals constructed through the Hill-Burton Hospital Construction act have opened or will open in the near future in the state. The hospitals are the Phelps County Hospital at Rolla, the Dunklin County Hospital at Kennett, the Perry County Hospital at Perryville and the Pemiscot County Hospital at Hayti.

John S. Knight, Chairman,
Trawick Stubbs,
R. M. S. Barrett,
O. J. Gibson,
Oliver Abel.

The report of the Committee on Cancer, E. C. Ernst, M.D., St. Louis, Chairman, follows:

REPORT OF THE COMMITTEE ON CANCER

It would be time-consuming to present in detail the many cancer services rendered the indigent cancer patient and the professional and lay educational activities initiated in the Councilor Districts of Missouri by the physicians of the Association, in cooperation with the various nursing groups, lay field army commanders, deputies, cancer dressing units and field army workers (both men and women). Day in and day out, they have unselfishly devoted their spare time and donated their personal funds in the interest of the state-wide cancer program.

Most of these activities are largely initiated and directed by the executive officers and executive committee of seventeen members and seventy lay members and physicians comprising the board of directors of the Missouri Division of the American Cancer Society.

It should be emphasized that the Cancer Section of the State Public Health Division and the Association Cancer Committee cooperate in all of these activities. No less than twelve months of unselfish service is rendered each year by this group in the interest of the cancer patient, except, perhaps, during the month of April, when part of their activities are also directed toward raising the necessary funds for duplicating the program including basic and clinical cancer research commitments. Both the local and national fund raising campaigns must be financially successful; otherwise, future state cancer activities will be correspondingly curtailed.

During the last year, the various cancer service programs of the American Cancer Society and the State Division of Health throughout rural Missouri and the larger community centers in Kansas City and St. Louis have been more widely distributed and are today more favorably and effectively organized in cooperation with the Cancer Committee of the Association.

It should be mentioned, however, that the somewhat limited 1950-1951 budget of the Missouri Division of the American Cancer Society, in view of recent reductions in the available state health appropriations from the federal cancer grants, might require curtailment of the planned more extensive state-wide cancer surveys and educational projects. This may also affect the clinical diagnostic programs of the indigent cancer groups throughout the various Councilor Districts. Fortunately, the Ellis Fischel State Cancer Hospital continues to service the central counties of our state most efficiently. Tribute should be extended to the State Cancer Commission, to the Directors of the State Health Department (Cancer Division), Drs. Hamilton and Meinershagen, as well as to the Medical Staff of our State Cancer Hospital, for their past year's accomplishments and cooperative spirit shown by each of these groups toward improving the cancer service of this state institution. This also includes the development of a well balanced cancer training program.

New cancer service projects and educational programs have been established during the last year. The various surgical, pathologic and radiologic conferences and seminars have been well attended and the Committee again urges more active participation by the medical profession in taking advantage of these educational opportunities.

The question of broadening the rural cancer activities, traveling diagnostic teams, which might be organized by the various hospitals, medical centers and teaching institutions, with or without the use of mobile cancer unit trucks should continue to be given more serious consideration in cooperation with the Councilor District medical programs of the State Medical Association.

However, because of the present limitation of the cancer budget for the coming year, this phase of the state program must be conservatively directed. It should again be emphasized that any type of program is not initiated unless an official directive request is received from the county or district requesting such a program and has the full approval of the Council and local medical society.

The facilities for the professional postgraduate training and lectures program in the field of diagnosis and early detection of cancer again will be made available in the larger medical centers in St. Louis, Kansas City, Barnard Free Skin and Cancer Hospital, Homer Phillips Hospital, and in Columbia at the Ellis Fischel State Cancer Hospital, for those physicians wishing to take advantage of so-called "refresher courses." It is hoped that an increase of these facilities will be seen during the coming year. Perhaps in the past these diagnostic courses or clinics have not been sufficiently publicized in advance to allow the members of the medical profession to arrange their home appointments. The Committee suggests, therefore, that through the Missouri Division of the American Cancer Society bulletin and the state and local journals greater publicity should be given these diagnostic cancer seminars.

As in the past, the three state organizations upon whom the Missouri Cancer Program is dependent; namely, the Missouri State Medical Association, the Missouri Division of the American Cancer Society, and the Cancer Division of the Missouri Department of Health, continue to contribute to and direct the diagnostic and educational cancer activities throughout the state.

Both the lay groups and the physicians interested in cancer have requested an answer as to the desirability of making cancer a reportable disease—either voluntary or by legal enactment of the state legislature. From a fundamental and statistical standpoint, this is seemingly an ideal concept and, in order to determine whether or not such a procedure is practical, the executive director of the Missouri Division was authorized to make a survey of the cancer control programs initiated in the various states. This statistical data has been turned over to the Cancer Committee and, although in-



MORE HOURS *of Allergy Relief...*

8 to 24 from a single dose

Look in the file of clinical reports on antihistaminics and it will be apparent that one is outstanding for prolonged action. It is Di-Paralene Hydrochloride (Chlorcyclizine Hydrochloride, Abbott), a "different" antihistaminic with a piperazine side chain rather than one of the conventional types.

Numerous clinical reports attest to the longer lasting allergy relief with Di-Paralene. In many cases relief up to 24 hours can be obtained from a single dose. Initially, Di-Paralene should be administered in 50-mg. doses three times a day for the average adult, but in the majority of cases this dosage can later be reduced to one or two doses a day. One 50-mg. tablet at bedtime often provides symptomatic relief through the night. Frequently, no additional dosage is required until the next bedtime. Undesirable side-effects are comparatively few and mild.

This season try longer-acting Di-Paralene in your allergy cases. Available at prescription pharmacies in 50-mg. and 25-mg. tablets in bottles of 100 and 500. **Abbott**

Specify

Abbott's new long-acting antihistaminic

DI-PARALENE TRADE MARK *Hydrochloride*

(CHLORCYCLIZINE HYDROCHLORIDE, ABBOTT)

REFERENCES: Spielman, A. D. (1950), N. Y. St. J. Med., 50:2297, Oct. 1. Brown, E. A., et al. (1950), Ann. Allergy, 8:32, Jan.-Feb. Jenkins, C. M. (1950), J. Nat. Med. Assn., 42:293, Sept. Cullick, Louise, and Ogden, H. D. (1950), South. Med. J., 43:632, July. Ehrlich, N. J., and Kaplan, M. A. (1950), Ann. Allergy, 8:682, Sept.-Oct.

complete, certain important information has been evaluated by the Committee.

Of the twenty-six states contacted, twelve have inaugurated a system of reporting all cancer cases to the Division of Health. Whether or not these reports were limited to biopsy proven cases could not be ascertained in this survey. Five states have legislative enabling acts, while eight have neither legal nor health department regulations. In only one state has there been a misdemeanor penalty of a $10.00 to $100.00 fine for failure to report cancer patients to the State Health Department. In only two states of the twenty-six, has the reporting of cancer cases been satisfactory and found to have statistical merit. Twenty-four states made no comment, or emphasized their unsatisfactory experience with the procedure of reporting all cancer cases to the Department of Health.

In Minnesota, the legal requirement for organizing a "cancer statistical research service," whereby all cancer cases are reported to the state board, and also for the establishment by law of the confidential character of such information, has recently been temporarily suspended for the purpose of reviewing the effectiveness and relative value, if any, of the obtained statistical data.

The added responsibility of questionable legal protection to the doctor or institution voluntarily reporting their findings, however, is being critically reviewed in other states by their legal counsel.

The College of Surgeons is interested in this procedure, believing that the reporting of all cancer cases to a single state or cancer registry has merit in the interest of the public and cancer statistics, and prefer the voluntary to the compulsory system of reporting cancer; nevertheless, both systems have their limitations. Any type of regulation to be adopted would require considerable additional paper work on the part of the doctor's office.

Several states have adopted local spot-check cancer control programs in county groups or Councilor Districts, but the final results have as yet not been evaluated.

The Committee has no final recommendation to make except to review the preceding evaluation of a somewhat "spotty" survey of the experiences reported by a limited number of states. Since the majority of the states, with the exception of two, are on record as agreeing that the voluntary or mandatory method of reporting cancer has not proven to be satisfactory; therefore, it would seem logical that some other more practical and reliable method for determining the incident of cancer in Missouri should be investigated.

Edwin C. Ernst, Chairman,
E. Kip Robinson,
Everett Sugarbaker,
Wm. E. Leighton,
Marvin Knapper.

The report of the Committee on Medical Economics, G. A. Aiken, M.D., Marshall, Chairman, follows:

REPORT OF THE COMMITTEE ON MEDICAL ECONOMICS

The Committee did not meet during the year. It does, however, wish to call to the attention of members the present status of the Blue Cross and Blue Shield plans in Missouri.

ST. LOUIS BLUE CROSS

Membership, January 1, 1950	953,713
Membership, December 31, 1950	1,032,472
Reserve per agreement	$6.21
Reserve per participant	$2.62
Number of cases hospitalized	124,632
Number of days hospitalization	922,942
Average days stay for year	7.4
Amount paid hospitals during year	$8,365,300.91

KANSAS CITY BLUE CROSS

Membership, December 31, 1949	279,908
Membership, December 31, 1950	315,284
Reserve per agreement	$4.42
Reserve per participant	$2.01
Number of cases hospitalized	39,694
Number of days hospitalization	295,418
Average days stay for year	7.4
Amount paid hospitals during year	$2,794,315.96

MISSOURI MEDICAL SERVICE (BLUE SHIELD) ST. LOUIS

Membership, January 1, 1950	214,472
Membership, December 31, 1950	286,543
Reserve per agreement	$7.16
Reserve per participant	$3.25
Number of cases paid for during year	31,781
Amount paid to participating physicians during the year	$1,642,930.00

KANSAS CITY BLUE SHIELD SURGICAL MEDICAL CARE

Membership, December 31, 1949	242,029
Membership, December 31, 1950	284,152
Reserve per agreement	$2.25
Reserve per participant	$1.02
Number of cases paid for during year	61,788
Amount paid to participating physicians during the year	$2,269,342.65

G. A. Aiken, Chairman,
B. L. Sinner,
A. P. Rowlette,
C. T. Herbert,
M. S. Harless.

The report of the Committee on Mental Health, Frank M. Grogan, M.D., St. Louis, Chairman, follows:

REPORT OF THE COMMITTEE ON MENTAL HEALTH

The Committee approves the proposal that outpatient psychiatric clinics be formally established at each of the State Hospitals. Under this plan each of the State Hospitals could provide outpatient psychiatric care for individuals otherwise unable to secure such attention. While all of the Missouri State Hospitals now provide some outpatient care, under existing conditions this service is, in most instances, rendered by the regular resident staff and personnel already burdened with far more inpatients than they are properly able to attend.

The Committee believes the primary need is adequate personnel to properly administer to the inpatient service, and that the establishment of an outpatient clinic should be predicated on additional personnel specifically assigned to conduct outpatient psychiatric clinics.

The Committee recommends expansion of the inservice training program now being conducted in the several State Hospitals, and the establishment of such training courses on a more formal basis. The Committee recommends that various portions of the programs be assigned to each hospital so that one or more hospitals might provide a course of psychiatric training for attendants or psychiatric aides, others for graduate nurses, while one or two could provide specialized courses in psychiatry for staff physicians.

The Committee further recommends that federal or state funds, now available for the advancement of mental hygiene in the State of Missouri, be used to finance the programs of outpatient clinics and of in-service training of personnel.

The Committee has been asked to support a bill in the legislature which proposes to license clinical psychologists. The Committee is definitely in favor of licensing clinical psychologists, but is of the opinion that the qualifications and training requirements for such

licensure as set forth in the proposed bill are wholly inadequate and would not provide the psychologist with sufficient preparation for the practice of such an important profession.

The Committee is mindful of the fact that many diseases of a physical nature closely simulate mental and emotional disorders, and believes the candidate for license to practice clinical psychology should be well trained in those basic sciences and many of the clinical subjects now required for licensure for the practice of medicine. The bill, as now written, does not include these training requirements. The Committee, therefore, disapproves this bill and recommends that the bill be rewritten to include these necessary qualifications.

F. M. GROGAN, Chairman,
B. LANDIS ELLIOTT,
PAUL HINES,
EMMETT H. HOCTOR,
ERNEST H. PARSONS.

The report of the Committee on Maternal Welfare, E. Lee Dorsett, M.D., St. Louis, follows:

REPORT OF THE COMMITTEE ON MATERNAL WELFARE

The Committee on Maternal Welfare met in Jefferson City March 4, 1951, to consider a number of important matters coming under its purview. Those present were: Drs. E. Lee Dorsett, St. Louis, Chairman; Leo J. Hartnett, St. Louis; E. E. Wadlow, St. Joseph; K. E. Cox, Kansas City; J. L. Johnston, Springfield; Buford G. Hamilton, Director, Division of Health, Jefferson City; L. M. Garner, Division of Health, Jefferson City; Mr. Clyde Bridger and Mr. Jack Hardin, Department of Vital Statistics, Division of Health, Jefferson City; Mr. Ray McIntyre, Field Secretary, and Mr. T. R. O'Brien, Executive Secretary, Missouri State Medical Association.

The Chairman presented a letter from the Council on Medical Service of the American Medical Association explaining the basis for the questionnaire to be filled out by the Committee relating to the functioning of the EMIC Program in the State of Missouri during World War II. It was pointed out that the U. S. Childrens Bureau had under consideration the instituting of a new EMIC Program supposedly patterned after that of World War II. The information requested through the questionnaire should conceivably be helpful to the American Medical Association in advising the Childrens Bureau on any such program.

Dr. Hamilton, under whom such a plan would be administered in Missouri, explained to the Committee that he was desirous of expressions from the medical profession over the state on this matter of reinstituting an EMIC Program and how it should be set up and operated in this state. Following a full discussion by committee members, the following motion was made and passed: This Committee favors the participation of the medical profession of this state, in and if, an EMIC Program similar to World War II is instituted—providing:

a. Free choice of physician is granted.

b. The physician in charge of the case be in attendance at the delivery, to receive reimbursement under the plan.

c. Payment for prenatal, natal and postnatal care is made only to the individual participating physicians.

d. An acceptable fee schedule is set up.

The Committee, after due deliberation, made the following basic recommendations as to a fee schedule for obstetric, prenatal, natal and postnatal care in the event an EMIC Program is reinstituted.

Prenatal Care (nonobstetrical care excluded): $5.00 for the first visit, $3.00 for all subsequent visits, and $5.00 for any house call.

Maximum payment for prenatal care, $26.00.

Natal and Postnatal Care: $70.00 (this also entitles the patient to postpartum examination in the second postpartum month).

Routine prenatal maximum laboratory fee of $10.00 be allowed, payable to any laboratory approved by the Missouri Division of Health.

A smaller committee composed of Drs. Dorsett, Hartnett and Mr. O'Brien was appointed to propose a more detailed construction of a fee schedule.

The Chairman presented for the Committee's perusal some seventy-five copies of maternal death certificates for the year 1950. These had been sent to the Committee from the Bureau of Vital Statistics of the Missouri Division of Health. It was plainly evident from the discussion of these reports that further study of these and future certificates is needed insofar as the cause of death and contributary causes of death are misleading and incorrect. In view of this observation, the Committee passed the following motion: "That the Committee on Maternal Welfare develop and send a questionnaire, to be filled out by the attending physician at each maternal death, and return it to the Committee for review." The information in these reports will be studied by the Committee but in no way is it to be considered critical. It will be held in strict confidence and will not be made public at any time. This study, it is hoped, will be useful in ascertaining the cause of maternal death and to see if in certain instances some of these deaths might have been preventable. The information gained by this will be of benefit to all physicians.

E. LEE DORSETT, Chairman,
E. E. WADLOW,
K. E. COX,
LEO J. HARTNETT,
J. L. JOHNSTON.

The report of the Committee on Infant Care, G. V. Herrman, M.D., Kansas City, Chairman, follows:

REPORT OF THE COMMITTEE ON INFANT CARE

The Committee met in St. Louis, March 28, 1950, with the Missouri State Medical Association's Committee on Maternal Welfare. These Committees jointly approved of the following:

a. The Committees shall develop postgraduate programs for presentation before the county and district societies throughout the state.

b. That in the development of such programs, special emphasis will be given to the care of the premature newborn.

c. That in the development of these programs, the Committees will be pleased to have the cooperation of the State Division of Health.

Arrangements were made with the Committee on Postgraduate Course to sponsor programs on the care of the premature newborn. Five programs on this subject were presented during the year, in each case an obstetrician outlining the difficulties relating to birth and a pediatrician presenting methods of care for premature newborn.

It was further recommended by the Committee that it have representation on the Standing Committee on Scientific and Postgraduate Work and Dr. H. E. Petersen was appointed by the President to serve in this capacity. The Committee assisted in the arrangements for the 1951 Annual Session Scientific Program. Dr. John A. Bigeler, Pediatrician of Chicago, will address the meeting.

G. V. HERRMAN, Chairman,
H. E. PETERSEN,
PETER G. DANIS,
PARK J. WHITE,
EUGENE SCHWARTZ,
JOSEPH C. JAUDON,
DANIEL B. LANDAU.

The report of the Committee on Health and Public Instruction (McAlester Foundation), A. W. McAlester, III, M.D., Kansas City, Chairman, follows:

REPORT OF THE COMMITTEE ON HEALTH AND PUBLIC INSTRUCTION

The Committee on Health and Public Instruction is pleased to report "stepped-up" activity in health education activities in the state, particularly in the rural areas. A number of Woman's Auxiliaries to County Medical Societies have done fine work in promoting lay health education in their communities. Much of this has been done by sponsoring special invitation and open-to-the-public meetings at which competent speakers have discussed pertinent health subjects. The Committee has been called on at frequent intervals to furnish speakers for these occasions.

The Committee has been pleased with the opportunity to furnish speakers for numerous civic clubs and other organized groups on the subject of national compulsory health insurance as part of the health education promotional program.

Health Forums, or open public meetings at which practical health information is presented through films, speakers or discussion panels, have been sponsored by County Medical Society and Auxiliary forces in Buchanan, Cole, Greene, Jackson, Jefferson, Lafayette, Mississippi-New Madrid-Scott, St. Louis counties, and St. Louis City.

This Committee, for the second consecutive year, with the cooperation of the Bureau on Scientific Exhibits of the American Medical Association, sponsored a health information exhibit at the Missouri State Fair at Sedalia, August 20 through 27. The exhibit "The Skin in Health and Disease" was displayed through "The Hall of Health" in the Educational Building on one of the main thoroughfares of the fair grounds. Thousands of people manifested considerable interest in this exhibit and it is felt that many people were reached from a health education standpoint. A large amount of literature from the American Medical Association Educational Campaign was distributed to those visiting the display.

The large number of medical and health articles appearing in publications of all kinds, written for lay consumption, seems to present some evidence of greatly expanding public interest in personal health. The Committee believes that the medical profession, trained accordingly, should take the lead in satisfying this evidenced desire by the general public for pertinent health information.

This Committee maintains in the Association headquarters office lists of health material information and films that are available. The Bureau of Health Education of the American Medical Association has available for County Medical Society use radio transcriptions on health subjects that local radio stations may use.

The Committee takes this opportunity to express sincere appreciation to all those who have given of their time, energy and funds in this cooperative effort to disseminate practical health information to the general public.

A. W. McAlester, III, Chairman,
Claude J. Hunt,
J. Earl Smith,
M. K. Underwood,
B. E. DeTar.

The report of the Committee on Constitution and By-Laws, W. L. Allee, M.D., Eldon, Chairman, follows:

REPORT OF THE COMMITTEE ON CONSTITUTION AND BY-LAWS

The Committee has given considerable study to the Charter, the Constitution and the By-laws.

CHARTER

As a result of its deliberations, and with legal advice, the Committee recommends that the House of Delegates approve seeking an amended Charter from the Circuit Court to correct inadequacies in the present Charter. The Committee and its legal adviser are of the opinion that instead of making provision for a fixed number of officers and specific activities, the Charter should be made highly flexible by making its provisions for officers and activities as broad and nonspecific as possible. With this in mind we propose for your consideration and action the following new Charter for submission to the Circuit Court of St. Louis:

Article I

This corporation, located in the City of St. Louis, State of Missouri, shall be known by the name and style of the Missouri State Medical Association, and by such name shall have the right to contract and be contracted with, to plead and implead, to sue and be sued, and shall have the right to acquire, own, hold, mortgage and dispose of such real and personal properties as shall be necessary for the proper maintenance and conduct of its affairs.

Article II

The purposes of this Association are, to bring into compact organization the entire medical profession of the State of Missouri, aiding thereby the extension of medical knowledge and the advancement of medical science; to promote and elevate the standards of medical education, to assist in the enactment and enforcement of just medical and public health laws; to encourage friendly intercourse among physicians, to enjoin and sustain measures of interest and advantage to the public and the medical profession; and, to promote the advancement of science, knowledge and skill in the medical profession.

Article III

The Association shall have the right to make such rules and regulations as may be necessary to carry out the purposes of the organization.

CONSTITUTION

The Committee feels that both a Charter and Constitution are necessary. It believes that the Association should not bind itself to the Courts whenever it becomes necessary or advisable to make a change in the Association's organic instrument. It believes also that there should be sufficient deliberation before such changes are made. A Constitution serves this purpose in that any change in it must lie on the table for one year before action is taken. It is felt that both Charter and Constitution should contain only expressions of permanent fundamental principles and that the By-laws should furnish the rules, regulations and working plan of the Association which may be readily changed when necessity warrants. Therefore the following Constitution is recommended to the House of Delegates for acceptance at this time to lie on the table for one year before action is taken.

Article I. Name of the Association

The name and title of this organization shall be the Missouri State Medical Association.

Article II. Purpose

The purpose of this Association is the promotion of the science and art of medicine, the protection of public health, the betterment of the medical profession, and, by uniting with similar organizations in other states and territories of the United States, to form the American Medical Association.

Article III. Membership

Membership in this Association shall be limited to



An "estrogen of choice for hemostasis is 'Premarin' in tablets of 1.25 mg. ... The usual dose for hemostasis is 2 tablets three times a day. If bleeding has not decreased definitely by the third day of treatment the dosage level may be increased by 50 per cent."*

*Fry, C. O.: J. Am. M. Women's A. 4:51 (Feb.) 1949

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and include all members in good standing in component societies which hold charters from this Association.

Article IV. House of Delegates

The House of Delegates shall be the legislative body of this Association and shall consist of delegates elected by the component societies. It shall elect a Speaker and Vice Speaker from its body. Its Secretary shall be the Secretary of the Missouri State Medical Association.

Article V. Council

The Council shall be the executive body of this Association when the House of Delegates is not in session. It shall be the judicial body of the Association when matters are referred to it for decision by the Association, by component societies or by individual members thereof. It shall consist of the President, President-Elect, Secretary, Treasurer and the duly elected Councilors from each Councilor District. Nine members shall constitute a quorum.

Article VI. Sessions and Meetings

Section 1. The Association shall hold an Annual Session at a place fixed by the House of Delegates, the time of which shall be fixed by the Council.

Sec. 2. Special meetings of the Association or of the House of Delegates may be called by a two third vote of the Council and shall be called upon a petition signed by members equal in number to one third of the total number of delegates certified for the last Annual Session.

Article VII. Officers

Section 1. The officers of this Association shall be a President, a President-Elect, three Vice Presidents, a Secretary, a Treasurer, a Speaker and a Vice Speaker of the House of Delegates and ten Councilors selected as provided for.

Sec. 2. All officers except Councilors shall be elected annually. The terms of Councilors shall be two years. Half of the membership of the Council shall be elected each year. The Secretary and the Treasurer shall be elected by the Council. The delegates present from each Councilor District shall meet on the morning of the last day of the Annual Session and elect the Councilor from that district. In the event of death, resignation or removal of any Councilor, the Council may appoint a successor to serve until the vacancy is filled at the next Annual Session. All of the officers shall serve until their successors are elected and installed.

Article VIII. Funds, Expenses and Budget

Funds shall be raised by a per capita assessment on each component society. The amount of the assessment shall be fixed by the House of Delegates. Funds may also be raised in any other manner approved by the House of Delegates. The Council shall submit an annual budget to the House of Delegates. All resolutions providing for appropriations shall be referred to the Council and all appropriations approved by the Council shall be included in the annual budget.

Article IX. Referendum

At any General Meeting of the Association it may, by a two thirds vote, order a general referendum upon any question pending before the House of Delegates. The House of Delegates may, by a vote of its members, submit any question to the membership of the Association for its vote. A majority vote of all members of the Association shall determine the question.

Article X. Seal

The Association shall have a common seal. The power to change or renew the seal shall rest with the House of Delegates.

Article XI. Amendments

The House of Delegates may amend any article of this Constitution by a two third vote of the delegates present and voting at any Annual Session, provided that such amendment shall have been presented in open meeting at the previous Annual Session and that it shall have been published twice during the year in The Journal of this Association or sent officially to each component society at least two months prior to the meeting at which final action is to be taken.

BY-LAWS

Since By-laws are dependent upon the Constitution, new By-laws are not submitted at this time but will be submitted for study of Delegates prior to the next Annual Session at which time this Constitution may be adopted. This will waste no time since By-laws can be acted upon by laying on the table one day, therefore could be passed at the next Annual Session.

A few changes in the present By-laws are suggested to make them conform to present custom, and the Committee recommends the following amendments to the present By-laws:

Amend Chapter II, Section 1, by striking out the second sentence, "Before them, at such times as may have been arranged, shall be delivered the annual addresses of the President and of the President-Elect and the annual orations" so that the section will read:

"Section 1. The General Meetings shall be open to all registered members and guests."

Amend Chapter III, Section 1, line 5, by striking out the word "third" and by inserting in lieu thereof the word "last," so that the section will read:

"Section 1. The House of Delegates shall meet annually at the time and place of the Annual Session. It shall remain in continuous session on the first day of the Annual Session and complete the work coming before it at that session. It shall meet on the last day of the Annual Session . . ."

Amend Chapter III, by adding thereto a new section, which shall read as follows:

Sec. 10. Order of Business:

(A) First Meeting

The following shall be the general order of Business of the House of Delegates for the First Meeting of the session:

1. Call to order by the Speaker
2. Report of the Committee on Credentials
3. Roll Call
4. Reading and Adoption of Minutes
5. Reports of Officers
6. Reports of Committees
7. Unfinished Business
8. New Business

(B) Last Meeting

The following shall be the general order of business of the House of Delegates for the Last Meeting of the session:

1. Call to order by the Speaker
2. Report of the Committee on Credentials
3. Roll Call
4. Reading and adoption of Minutes
5. Report of the Nominating Committee
6. Election of Officers
7. Reports of Officers
8. Reports of Committees
9. Unfinished Business
10. New Business
11. Installation of Officers
12. President's Appointments and Installation of Members to Committees
13. Selection of the Place for the next Annual Session

(C) Change of Order of Business

At any meeting of the House of Delegates the order of business may be changed by a two-thirds (⅔) affirmative vote of the members present and voting.

Amend Chapter IV, Sec. 2, by striking out all of Sec. 2.

Amend Chapter IV, Sec. 5, by striking out all of Sec. 5.

Amend Chapter IV by changing the section numbers, so that present Sec. 3 becomes Sec. 2, present Sec. 4 becomes Sec. 3, Sec. 6 becomes Sec. 4. (These changes become necessary because present Section 2 and 5 have been stricken out.)

Amend Chapter VI, Section 1, by striking out all of Section 1 and inserting in lieu thereof the following so that Section shall read:

"Section 1. The Council shall meet during the Annual Session at such times as necessity may require, subject to the call of the Chairman or on petition of three Councilors. It shall meet on the last day of the Annual Session of the Association to organize. It shall, through its Chairman, make an annual report to the House of Delegates."

Amend Chapter VIII, Sec. 4, by deleting all of Sec. 4.

After study of the present By-laws and proposed By-laws, the Committee agreed on several things for inclusion in By-laws which will be presented if the recommended Constitution is adopted.

It was felt that the Chairman of the Council should be elected by the Council and that the term of office of the Chairman of the Council should be limited to four terms of one year each.

It was felt that there should be three Vice Presidents.

It was felt that all committees should be standing committees instead of restricting them to a few principal committees with subcommittees because more interest would be taken in a standing committee than a subcommittee and a standing committee could speak with authority for itself without going through its superior committee.

It was felt that a planning committee was inadvisable at the present time because funds of the Association would not allow for further expansion in work or in committees.

W. L. ALLEE, Chairman,
B. LANDIS ELLIOTT,
PAUL BALDWIN,
J. H. SUMMERS,
CURTIS H. LOHR.

The report of the Committee on Fractures, Daniel L. Yancey, M.D., Springfield, Chairman, follows:

REPORT OF THE COMMITTEE ON FRACTURES

The Committee on Fractures held its first meeting of this year on January 23 at the Statler Hotel, St. Louis, in conjunction with the Missouri Regional Committee on Trauma of the American College of Surgeons.

These two Committees have the same objectives and it was decided that programs for 1951-1952 would be coordinated closely between the two. The program this year again will lay emphasis on the fundamental principles of fracture treatment with special emphasis on the splinting and transportation of the injured patient.

For the first time in several years, the Committees will present an exhibit at the Annual Session. The Committee has worked closely with the local committee in Kansas City and presentations of the subject matter will be in two parts:

1. Television program from the Kansas City General Hospital by Drs. Kiene and Meyer: (A) Splinting for the transportation of fractures of the spine and extremities, and (B) application of plaster of Paris.

2. Scientific Exhibit: (A) Demonstration of splints used in transportation of the injured, and (B) conference on fracture problems. The Committee will be happy to meet any member of the Association and discuss with him any fracture problem which he may have.

DANIEL L. YANCEY, Chairman,
W. R. BOHNE,
FRED REYNOLDS,
W. J. STEWART,
N. S. PICKARD,
JACOB KULOWSKI,
B. L. MURPHY.

The report of the Committee on Conservation of Eyesight, C. Souter Smith, M.D., Springfield, Chairman, follows:

REPORT OF THE COMMITTEE ON CONSERVATION OF EYESIGHT

For several years this Committee has worked toward the improvement of the vision of school children. This spring charts for testing vision of school children were distributed to all schools in the state, numbering near 10,000. A simple chart and simple instructions were placed in the hands of every school teacher. The instructions asked that the teacher report any abnormality in vision to the parents of the child with the suggestion that the child have further examination and care. The Committee realizes that it would be ideal if every child could be examined by an ophthalmologist but it feels that the use of the eye charts in schools will so channel the more drastic cases.

The Committee is deeply indebted to the Department of Education for the distribution of the charts and instructions, to the Bureau for the Blind for its close cooperation and to the Council for making it possible to have the charts and instructions printed.

Through the Bureau for the Blind and the Division of Welfare pamphlets on "Causes of Blindness in Missouri" and "Glaucoma" were made available to all ophthalmologists and optometrists in the state.

Through a subcommittee of the Committee, talks on "Common Diseases of the Eye" have been arranged before various medical groups. Each talk has included a discussion of glaucoma, the most important cause of blindness in Missouri.

The Committee felt that vision testing was only a portion of the need in a revision of the drivers' licensing laws in the state and that the Committee should not sponsor a bill of its own in the Legislature but should support any bill that included this phase. A bill introduced in the House includes "applicant satisfies examiner that he has sufficient eyesight to operate a motor vehicle with a reasonable degree of safety." This is not as far reaching as the Committee feels it should be but does give some protection.

The Committee is still interested in encouraging ophthalmologists to become Board members and still offers to be of any assistance possible.

The Committee is collecting data from other states on the compulsory reporting of visual disabilities but does not feel that it is ready to attempt to obtain such legislation in Missouri but hopes to at a future time.

The Committee is interested in the revision of the Workmen's Compensation law but feels that it should not take the lead in such legislation but support any constructive legislation introduced.

The Committee thanks the House of Delegates for

its past support of its work and asks that the Committee have approval to continue with its present work.

C. Souter Smith, Chairman,
A. N. Lemoine,
H. B. Stauffer,
Robert S. Minton,
Robert Mattis,
W. L. Post,
Philip Luedde,
John McLeod,
G. J. Tygett,
S. L. Freeman,
C. H. Brady,
E. D. Tenagli,
Albert Hanser,
George A. Hornback.

The report of the Committee on Control of Venereal Disease, A. W. Neilson, M.D., St. Louis, Chairman, follows:

REPORT OF THE COMMITTEE ON CONTROL OF VENEREAL DISEASE

A meeting of the Committee on Control of Venereal Disease was held in Jefferson City on January 24, 1951, with the following present: Drs. A. W. Neilson, St. Louis, Chairman; E. M. Cannon, St. Louis; E. A. Belden, Chief of the Bureau of Communicable Diseases, Missouri Division of Health; Buford G. Hamilton, Director, Missouri Division of Health; G. D. Barton, Surgeon, U. S. Public Health Service; Miss Mabel Mortvedt, Nursing Consultant, Missouri Division of Health; Mr. John Hove, Health Program Representative, Missouri Division of Health; and Mr. Ray McIntyre, Field Secretary, Missouri State Medical Association.

The meeting was called to consider the Venereal Disease Control program in the State of Missouri for the year 1951. A review of last year's program and the consideration of the program for 1951 was thought important because of rearmament activities. The problem of the Midwestern Medical Center in St. Louis is of extreme importance since there has been a declining venereal disease rate in the State of Missouri and since funds available to the State of Missouri for operation of the center are now being diverted for defense purposes. In view of these facts, it had, up to the time of the Korean war, been thought a good plan to close the Midwestern Medical Center. Now that many doctors throughout Missouri are entering Military Service and that the City of St. Louis is showing an increasing venereal disease rate, it was felt necessary to reconsider this problem.

The Committee recommends the following be done in view of the facts brought out at this meeting:

1. Continue the operation of the Midwestern Medical Center. The Center will draw patients primarily from St. Louis, Southeast Missouri, Fort Leonard Wood area, East St. Louis and Southern Illinois.

2. Outstate Missouri for the most part will handle its Venereal Disease problem in two ways:

a. In areas in which there are city or county health departments, clinics will be instituted where necessary. Where there are no health departments, clinics will be instituted where the need is greatest and where public health nursing service is available.

b. Fee. For Service.

1. In areas served by city or county health departments, as well as in areas where clinics are not feasible, private physicians would handle cases of venereal disease at the request of the city or county health department on an established fee for service basis. In as much as local health departments receive venereal disease funds in accordance with their need, whether the funds are used for the clinic or for the fee for service plan would depend upon the local circumstances. Within reason, the local health officer will determine how best to handle the situation.

2. Where there is no health department, a fee for service plan would have the advantage over an instituted clinic, of better geographic coverage, freedom of choice of physician, less nursing time and freedom to take action immediately rather than wait for the clinic day.

In short, the Venereal Disease Control plan for the State of Missouri includes:

1. Continuation of operation of the Midwestern Medical Center.

2. In outstate Missouri a fee for service plan utilizing the private physician in some areas and in other areas the establishment of clinics.

This plan will make possible a transition from the Midwestern Medical Center to a plan utilizing the doctors of the State of Missouri, either privately or in clinics. The transition can be made over a long enough period of time so that a smooth working program can be evolved. Funds to operate this entire program are provided through the Missouri Division of Health.

It is felt that, by these means, the increased venereal disease rate following the expansion of industrial and wartime production efforts caused by rearmament activities can be counteracted.

The Committee also considered the problem of increasing professional interest in venereal disease control. It is thought important that more articles of interest along venereal disease lines be published in the Missouri State Medical Journal. Certain field trips and meetings are also projected.

The Committee considered the results of a questionnaire from the Division of Health to Missouri practitioners concerning the free distribution of drugs for the treatment of venereal disease and the distribution of venereal disease information through the *Venereal Disease Information Journal.*

The Committee feels that in view of the fact that many Missouri physicians indicated their interest in this journal and their interest in receiving free drugs for indigent venereal disease patients, that both of these services should be continued.

A. W. Neilson, Chairman,
James C. Cofer,
Charles C. Dennie,
E. M. Cannon,
W. S. Sewell.

The report of the Committee on Industrial Health, V. T. Williams, M.D., Kansas City, Chairman, follows:

REPORT OF THE COMMITTEE ON INDUSTRIAL HEALTH

Two meetings of the Committee were held during 1950. Representatives of the Bureau of Public Health Engineering of the State Division of Health attended these meetings. The Committee approved the suggestions of the Bureau that bills be presented in the legislature to make changes in the laws of the state relating to the reporting by physicians of industrial diseases. The changes suggested will simplify the methods of reporting. The Committee has continued to receive excellent cooperation from the Division of Health and wishes to thank Mr. L. E. Ordelheide and Mr. Louis F. Garber for their help.

The Committee, in collaboration with the Division of Health, sponsored a program on Industrial Health in St. Louis on February 13, 1951, and in Kansas City on February 14, 1951. A most interesting talk entitled "Medicine, Mobilization and Manpower" was presented by Mr. Eugene J. Taylor, New York City. Mr. Taylor is associated with Dr. Howard Rusk in rehabilitation work and is a member of the staff of the New York *Times*. Dr. Vincent T. Williams, Kansas City, discussed the "Industrial Physician, Health Officer of the Industrial Community." Notices regarding these meetings were sent to all interested persons by the Division of

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Surgical Anatomy & Clinical Surgery, Two Weeks, starting July 23, August 20, September 24.
Basic Principles in General Surgery, Two Weeks, starting September 10.
Surgery of Colon & Rectum, One Week, starting September 17, October 15.
Esophageal Surgery, One Week, starting October 15.
Thoracic Surgery, One Week, starting October 8.
Gallbladder Surgery, Ten Hours, starting October 22.
Breast & Thyroid Surgery, One Week, starting October 1.
General Surgery, One Week, starting October 1.
Fractures & Traumatic Surgery, Two Weeks, starting October 8.

GYNECOLOGY—Intensive Course, Two Weeks, starting September 24, October 22.
Vaginal Approach to Pelvic Surgery, One Week, starting September 17, November 5.

MEDICINE—Intensive General Course, Two Weeks, starting October 1.
Gastroenterology, Two Weeks, starting October 15.
Electrocardiography & Heart Disease, Two Weeks, starting October 22.

UROLOGY—Intensive Course, Two Weeks, starting September 24.

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Health and by the Associated Industries of Missouri. The program was presented in St. Louis before the senior class of St. Louis University School of Medicine. The Committee wishes to take this opportunity to thank the Dean of the Medical School for the excellent cooperation. For the last two years one of the projects of the Committee has been the presentation of industrial health subjects before medical students in an effort to encourage the teaching of these subjects as part of the regular curriculum.

Plans are being made to present similar programs in 1951 and 1952.

V. T. Williams, Chairman,
E. M. Fessenden,
A. M. Ziegler,
R. A. Sutter,
Horace F. Flanders,
R. Emmet Kelly,
H. M. Roebber,
Vencel Hollo.

The report of the Committee on Anesthesiology, C. R. McCubbin, M.D., Kansas City, Chairman, follows:

REPORT OF THE COMMITTEE ON ANESTHESIOLOGY

The efforts of the Committee on Anesthesiology have been allied closely to the work of the Missouri Society of Anesthetists. The aim of this society is the advancement of the status of anesthesiology throughout the State of Missouri. This has been furthered during the last year by sending articles on anesthesia to each doctor in the state who is actively engaged in giving anesthetics.

The Committee has obtained ten or more doctors in the state as members of the national organization. The Committee also has been indirectly responsible for the placement of four more full time anesthesiologists in Missouri.

As a result of this contact with part time anesthetists, the attendance at the monthly meetings of local societies of both Kansas City and St. Louis has been increased greatly as well as the membership by the out of town men.

The Committee is now working on further plans for refresher courses for part time anesthetists in the teaching hospitals located in different areas in the state.

C. R. McCubbin, Chairman,
Joseph A. McNearney,
H. J. Freiheit,
O. T. Blanke,
Milton C. Peterson.

The report of the Committee on Physical Medicine, F. Garrett Pipkin, M.D., Kansas City, Chairman, follows:

REPORT OF THE COMMITTEE ON PHYSICAL MEDICINE

There has been no general activity of this Committee for the last year. No meetings have been held.

One problem concerning attempted licensure of the irregular therapists has been referred through channels to the legislative committee.

In the Kansas City area the Rehabilitation Institute is making great headway. A special building at 36th and Troost streets has been purchased for it housing and was occupied about January 1, 1951. This is a three story building and will greatly expand rehabilitation facilities in the western part of the state. This Institute has already attained national attention and many out of state visitors have come to see its operation. Scientific exhibits demonstrating its advantages have been presented at the last medical meetings in the state and have received favorable comment. It is hoped that as many doctors as possible will visit the new home of the Institute while in Kansas City for the 1951 session.

Garrett Pipkin, Chairman,
Emmett Settle,
Luke A. Knese,
A. J. Kotkis,
J. L. Washburn,
M. P. Leech.

The report of the Committee on Tuberculosis, E. E. Glenn, M.D., Springfield, Chairman, follows:

REPORT OF THE COMMITTEE ON TUBERCULOSIS

The Committee met in St. Louis on March 11, 1951, with a full day's agenda. Those present were: Drs. E. E. Glenn, Springfield, Chairman; W. P. McDonald, St. Joseph; Paul Murphy, St. Louis; C. A. Brashear, Mt. Vernon; I. J. Flance, St. Louis; J. L. Mudd, St. Louis; Buford Hamilton, Director, Missouri Division of Health; H. S. Miller, Director, Bureau of Tuberculosis Control, Division of Health; H. L. Mantz, Kansas City; Mr. Donald Pratt, Executive Secretary, Missouri Tuberculosis Association; Mr. T. R. O'Brien, Executive Secretary and Mr. Ray McIntyre, Field Secretary, Missouri State Medical Association.

Dr. Hamilton discussed a number of progressive steps that have been taken by the Division of Health and its advisors to improve tuberculosis control in Missouri. A great deal of recent improvement has been made in the facilities at Mt. Vernon for taking care of more patients and for the improvement of that care. This has been made possible primarily through an increase in staff personnel, added equipment and building facilities and adjustments in salary scales. He also explained plans, now in progress, for gaining residency training approval at the State Sanatorium. Dr. Hamilton mentioned that it had been proposed that the Confederate Soldiers Home at Higginsville be taken over by the Missouri Division of Health with the idea of revamping it for use in taking care of tuberculosis patients. He feels that present cooperative efforts between various organizations and groups working on tuberculosis programs are good but believes that greater cooperative efforts are needed.

Dr. Miller posed a number of questions for the Committee's consideration:

1. How to secure good evaluation of tuberculosis sanatorium treatment in Missouri.
2. Standards for chest clinics.
3. Who is responsible for indigent tuberculosis care in localities where it is not practical to establish chest clinics?
4. Clarify relationships between practicing physicians and health departments on tuberculosis care and control.
5. Practicality of setting up a Central Tuberculosis Register for the state.
6. What are the general responsibilities of the State Sanatorium on the entire matter of tuberculosis control?
7. What, if any, are the responsibilities of County Medical Societies for tuberculosis control where no local health departments exist?

These questions were discussed by the group and Committee action, as later presented in this report, was taken relating to some of them.

Dr. Brashear reported that there were at present 550 patients at Mt. Vernon under care. Patient capacity of the Sanatorium is set at 650. The ratio of patients to staff physicians is figured at a maximum of 75 patients per doctor. The need for additional physicians and nurses can be seen in the present patient load as against full capacity. Of the 550 patients at the Sanatorium, approximately one-fifth may be classified as custodial cases. This represents one of the more important problems of tuberculosis care. These patients

are taking up bed space which could be used for acute cases on the waiting list. What to do with custodial cases therefore poses no easy solution. The present patient per diem cost at Mt. Vernon Sanatorium is $6.50.

Dr. Mantz presented the problem of financing the tuberculosis hospitals, particularly with respect to Leeds in Kansas City and Koch in St. Louis which are operated as local institutions. He discussed the great value of routine chest x-ray for all hospital admissions and suggested that studies of Missouri relief laws be made in relation to tuberculosis and other medical aspects.

The Chairman of the Committee stated that copies of reports from members of this Committee on their surveys of the state mental hospitals pertaining to tuberculosis care and control would be made and sent to all Committee members by the headquarters office.

At the Missouri State Hospital Association annual meeting in St. Louis in November, 150, the Chairman of this Committee was asked to appear on the program and discuss the admission and emergency treatment of tuberculosis patients in general hospitals. This presentation was well received and elicited a lively and effective general discussion. It is felt that progress along the line of this discussion is being made over the state but much yet remains to be accomplished in this respect.

The following motions were considered and passed by due action of the Committee.

1. It is recommended that county courts be induced to make better financial arrangements in order to carry out recommended medical treatment for discharged State Sanatorium patients.

2. The Committee disapproved House Bill 171 which proposes that the Confederate Home of Higginsville be transferred to the Department of Public Health and Welfare to be used as a tuberculosis hospital.

3. A subcommittee of this Committee be appointed to survey with the aid of the State Association office the costs of the tuberculosis hospitals in the state with the idea of equalizing and reporting such to the full Committee with recommendations.

4. It is recommended that routine chest x-rays be taken on admissions to all hospitals as a valuable diagnostic procedure. In order to determine methods of carrying out this recommendation it is further recommended that contacts be made with the Missouri Hospital Association and the roentgenologists concerning this matter.

E. E. GLENN, Chairman,
LAWRENCE E. WOOD,
J. L. MUDD,
PAUL MURPHY,
C. A. BRASHEAR,
W. P. MCDONALD,
I. J. FLANCE,
F. E. MACINNIS,
H. L. GREENE.

The report of the Committee on Rural Medical Service, R. W. Kennedy, M.D., Marshall, Chairman, follows:

REPORT OF THE COMMITTEE ON RURAL MEDICAL SERVICE

The Year 1950 saw some fifty-eight physicians establish locations for medical practice in rural Missouri. This brings the total number who have located in rural Missouri since January 1, 1946, to more than 400. Many of these physicians secured much of the information on their locations through contacts with the physician's placement service maintained in the headquarters office. The Committee is continuing its efforts to locate physicians in communities needing additional services although the demand of the military services for large numbers of young doctors is reducing the prospects noticeably.

The Committee has decided to discontinue the panel discussions on rural practice for interns and residents in the hospitals of Kansas City, St. Joseph and St. Louis which have been presented in Kansas City and St. Louis for the last two years. This decision was made in view of the present situation which portends that many interns and residents who normally would welcome such a program will be going into military service.

The Missouri Health Council which was organized in July of 1948 under the sponsorship of this Committee in cooperation with other state-wide health minded organizations is demonstrating its value in health promotion activities. Its membership has increased to twenty-six state-wide member organizations and agencies and seventeen county council members. Profitable meetings of the State Council are held at regular intervals at which important health problems are considered and coordinated means for their solutions developed. The Missouri Health Council, also, has reaped noteworthy results in its promotion of County Health Councils and their programs.

Members of the Committee attended the sixth National Rural Health Conference held in Memphis, Tenn., February 22 to 24, 1951. This conference is sponsored annually by the Committee on Rural Medical Service of the American Medical Association in cooperation with national farm organizations. The overall theme for this year was "Why Wait—Let's Do It Ourselves." The program was centered around the planning and organization of health councils.

A number of new hospitals serving rural communities have opened recently or will do so in the immediate future. These are the Phelps County Hospital at Rolla, the Dunklin County Hospital at Kennett, the Perry County Hospital at Perryville and the Pemiscot County Hospital at Hayti.

This Committee takes this means of complimenting other committees of the Association which have helped so much in bringing health and medical information to the rural areas of the state.

R. W. KENNEDY, Chairman,
A. E. SPELMAN,
W. A. BROYLES,
W. J. SHAW,
R. B. WRAY,
M. M. HART,
A. S. BRISTOW.

The report of the Committee on Emergency Medical Service, Carroll P. Hungate, M.D., Kansas City, Chairman, follows:

REPORT OF THE COMMITTEE ON EMERGENCY MEDICAL SERVICE

During the last year, the members of the Emergency Medical Service Committee have studied the medical aspects of civil defense in the State of Missouri. The Missouri Director of Public Health, who has been designated as the Deputy Director of Medical Health Service in the State Civil Defense Program, has been present at all discussions of the problems.

Definitive action by the Committee has been delayed due to the fact that the State of Missouri has not had a Civil Defense Law on the statutes. A bill has been introduced in the legislature at the present session but, to date, that law has not been passed. There is nothing that anyone does in the field of Civil Defense which can be considered more than planning until there is some legal status to the State Civil Defense Organization.

The Committee on Emergency Medical Service has made certain recommendations to the State Health Director concerning the organization of the medical and allied professions in the state in the field of Civil Defense. The Committee also has made certain recommendations concerning the division of the state into sectors and districts.

At the present time, the Medical Health Services Organizational Chart for the state is being prepared in its final form. A manual which gives in detail the duties of physicians and allied groups in Civil Defense Program has been prepared in the rough and will be printed and disseminated to the profession as soon as it has been edited and accepted by the State Civil Defense Administration. Should this manual not be accepted expeditiously by the Missouri Civil Defense Administration, it is anticipated that it will be published as "A Plan" by the Missouri State Medical Association for the guidance of the medical profession in the state.

There are certain intangible results from the Committee's activities. Interest has been stimulated in many sections of the state resulting in the creation of local civil defense organizations with the medical profession in these communities taking a leading part. Members of the Committee have given many lectures on all phases of civil defense throughout the state. These lectures have been presented not only to medical groups but at city-wide Civil Defense rallies.

In conclusion, the Chairman feels that the Association, through its membership, has contributed, to date, more in the field of civil defense than any other group in the State of Missouri. The contribution has been greatest in the field of public education and that part of the program is 50 per cent of a strong Civil Defense Service.

Carroll P. Hungate, Chairman,
J. E. Schiffmacher,
B. Albert Lieberman, Jr.,
Robert W. Conrad,
R. A. Ritter,
A. P. Rowlette,
M. Pinson Neal,
L. David Enloe,
Curtis H. Lohr,
H. B. Goodrich,
A. S. Bristow,
G. E. Thoma,
William J. Shaw,
W. S. Sewell,
Norman P. Knowlton, Jr.,
Buford G. Hamilton,
S. A. Grantham,
H. E. Petersen,
Fred J. Biggs, Jr.,
B. L. Murphy.

The report of the Council, J. W. Thompson, M.D., St. Louis, Chairman, follows:

REPORT OF THE COUNCIL

The Council met at the Kentwood Arms Hotel, Springfield, on June 3 and 4, 1950, with J. W. Thompson, M.D., St. Louis, Chairman, presiding.

Those present were Drs. Donald M. Dowell, Chillicothe; W. F. Francka, Hannibal; J. W. Thompson, St. Louis; Otto W. Koch, Clayton; J. F. Jolley, Mexico; R. W. Kennedy, Marshall; Victor B. Buhler, Kansas City; W. S. Sewell, Springfield; E. C. Bohrer, West Plains; Frank W. Hall, Cape Girardeau; C. Edgar Virden, Kansas City; W. A. Bloom, Fayette; H. E. Peterson, St. Joseph; R. O. Muether, St. Louis; Victor Scherman, St. Louis; W. L. Allee, Eldon; F. T. H'Doubler, Springfield; Wallis Smith, Springfield; Joseph Johnston, Springfield; B. Landis Elliott, Kansas City; Buford G. Hamilton, Jefferson City; R. E. Duncan, Kansas City; Robert Mueller, St. Louis; E. C. Ernst, St. Louis; F. G. Pernoud, St. Louis; Messrs. W. H. Bartleson, Kansas City; D. E. Caywood, Springfield; Lemoine Skinner, Ray McIntyre and T. R. O'Brien, St. Louis.

The minutes of the last meeting were approved.

NATIONAL SOCIETY FOR MEDICAL RESEARCH

It was decided, upon motion of Dr. Koch, to contribute again this year to the work of the National Society for Medical Research in the amount of $50.00.

WHITE HOUSE CONFERENCE ON YOUTH

A letter asking for a contribution toward the White House Conference was read by Mr. O'Brien. After discussion, it was decided, upon motion of Dr. Hall, that no contribution should be made but that the organization should be written expressing the interest of the Council.

JUNIOR CHAMBER OF COMMERCE

Mr. Caywood presented a request of the Junior Chamber of Commerce that the Association become an associate member organization. After discussion, it was decided that the Association should become an associate member.

COMMITTEE ON CARE OF THE PATIENT

A letter from the Missouri Hospital Association suggesting a committee composed of three members of that association, three members from the Missouri State Medical Association and three from the Nurses Association was presented. It was decided to appoint such a committee, the members depending on those most interested and who could attend a meeting in St. Louis on July 8.

GRIEVANCE COMMITTEE

The resolution adopted by the House of Delegates, directing that difficulties should be handled at a local level, with the committee of the Council available for assistance, was explained. It was suggested that material informing county societies of experience in other states be sent.

ALCOHOL AS A DISEASE

The special committee appointed to study material furnished by Dr. S. D. Smith, Columbia, on alcohol as a disease gave the following report, which upon motion of Dr. Petersen, was adopted:

From factual data made available to the Special Committee on Alcoholism appointed by the Council to determine the Council's position on alcoholism as a disease, the Committee has come to the conclusion that:

a. Alcoholics are sick people;

b. The solution of the problem requires active participation on the part of the medical profession of Missouri;

c. The most effectual program directed toward the prevention of, and arrest of, alcoholism must be activated and maintained at local levels;

d. The Council urges the members of the Missouri State Medical Association to participate in the activities of adequately organized local groups to attack the problem of alcoholism;

e. The Council recommend to the House of Delegates at its next regular meeting the creation of an advisory committee on alcoholism, its principal duties being to study the subject and to advise various county medical society groups, who may interest themselves in the subject, as to how they might direct their activities most effectively.

CONTRACT WITH VETERANS ADMINISTRATION

Mr. O'Brien read a letter from the Veterans Administration asking that the contract which has been in effect be renewed on June 30, when the present one will expire. This was discussed from the standpoint of it setting a precedent which might be used by other organizations. It was decided that action on this be delayed until it could be further discussed.

COMMITTEE ON VENEREAL DISEASE

Dr. Sewell asked approval of the Council for the Committee on Veneral Disease to recommend to the



The Norbury Sanatorium

Established 1901—Incorporated—Licensed—Jacksonville, Illinois

• ALBERT H. DOLLEAR, B.S., M.D., Superintendent. FRANK GARM NORBURY, A.M., M.D., Medical Director. SAMUEL N. CLARK, M.D., Physician. HENRY A. DOLLEAR, M.D., Physician.





Maplecrest

• Pictured above — Restful, congenial homelike surroundings are combined with the most modern diagnostic and therapeutic equipment.

Maplewood

• Pictured at left — Most comfortable homes for individuals requiring rest, scientific diagnosis and treatment. Fireproof construction.

State Division of Health that the Midwest Treatment Center be continued and that six investigators be appointed by the Division to seek out venereal disease contacts, thereby further combatting the disease, and that district clinics be set up in appropriate places. It was brought out in discussion that the census at the Treatment Center had been dropping constantly and that also doctors were seeing fewer cases and that it was doubtful if the work needed acceleration. The committee, upon motion of Dr. Virden, was asked to reconsider its report with the recommendation that inasmuch as the census of the disease is dropping at the Midwest Medical Center, that it be considered that the Center be closed at the end of this year, and that the doctors be better informed on obtaining drugs from the Division of Health for treating these cases.

CARE OF THE INDIGENT

Attention was called to the meeting of June 2 when the care of the indigent was fully discussed. Upon motion of Dr. Virden, it was voted that Dr. Hamilton's proposals concerning indigent care be approved in principle and be referred to a committee with power to set up a pilot plan in one Councilor District in the state to determine how best to carry out the obtaining of medical care for the indigent persons and rehabilitation when possible. Drs. Buhler, chairman, Bohrer and Dowell, with Drs. Virden and Bloom, ex officio, were appointed on this committee.

A. M. A. DUES

The following report on dues of the American Medical Association was presented by Mr. O'Brien: District 1, 131 paid, 18 exempt of a total of 249 members; District 2, 63 paid, 17 exempt of 129 members; District 3, 783 paid, 23 exempt of 1,319 members; District 4, 159 paid, 22 exempt of 373 members; District 5, 82 paid, 3 exempt of 159 members; District 6, 71 paid, 10 exempt of 149 members; District 7, 418 paid, 14 exempt of 656 members; District 8, 144 paid, 14 exempt of 272 members; District 9, 36 paid, 2 exempt of 71 members; District 10, 101 paid, 9 exempt of 196 members; a total of 1,988 paid, 132 exempt, of 3,572 members.

ANNUAL SESSION 1951

Dr. Buhler reported on plans for the 1951 Annual Session, saying that there was a possibility of having color television again, but that the program had been planned with general meetings, medical and surgical programs, presented concurrently, a clinical pathologic conference, with the program made up principally by Missouri men, about six guest speakers to be invited.

POSTGRADUATE WORK

Dr. Buhler reported that organizations interested in postgraduate work in the state had been asked to have a representative of their organization meet with a committee of the Association to work out coordination of this work. He stated that a meeting would be held with these representatives as soon as they were made known. Audiovisual programs were discussed as part of the postgraduate work. Upon motion of Dr. Virden, Dr. Buhler's report was approved and the committee was instructed to go ahead with the work as outlined; also the committee was empowered to purchase a sound projector.

MISSOURI HEALTH COUNCIL

Mr. McIntyre reported on the recent annual meeting of the Missouri Health Council at which Dr. Haven Emerson, New York, was the principal speaker. He pointed out that in spite of a large attendance, few physicians were present. He stated that there are twenty-four state wide organizations and eleven county health councils in the Missouri Health Council. Copies of "Functions of the Health Council" by Robert Yoho, of the Indiana State Board of Health, were distributed.

AUDRAIN COUNTY HOSPITAL SUIT

Mr. O'Brien reviewed the Audrain County Hospital suit which is now being heard and said that the hearing would continue during the next week and that the outcome would be reported to members as soon as possible.

COMMUNITY HEALTH LEAGUE

Dr. Elliott spoke briefly on the Community Health League, urging Councilors to promote membership in the League and saying that a meeting of the League would be held in the near future.

CIVILIAN DEFENSE

Dr. Mueller, of the Association Committee on Civilian Defense, and Dr. Sewell, appointed by the Governor to study civilian defense in connection with atomic warfare, reported to the Council. Dr. Sewell said that recommendations were to be submitted to the Adjutant General of Missouri and asked that the Association Committee assist in these recommendations. It was decided that these two committees should work together and that they should recommend plans for emergency care; that the committee should volunteer its services to the Governor.

WOMAN'S AUXILIARY

Dr. Buhler discussed the work of the Woman's Auxiliary and presented the following four point program for the Auxiliary: (1) Essay contest; (2) assist in the national educational campaign; (3) provide programs for women at the Councilor District meetings which would be of value; (4) survey counties to find the number of physicians and families who are registered to vote and urge those that are not to do so. Upon motion of Dr. Bohrer, this program was approved.

BLUE CROSS

Blue Cross, especially in relation to the resolution which was passed by the House of Delegates, was discussed.

VETERAN'S CONTRACT

Upon motion of Dr. Buhler, it was voted that the contract with the Veterans Administration be renewed and a resolution was passed explaining the policy of the Association regarding fee schedules.

CONTRACT BY BLUE CROSS WITH OSTEOPATHIC HOSPITAL

The recent action of the St. Louis Blue Cross in entering into a contract with an osteopathic hospital was discussed. It was pointed out that the action is before the Blue Cross Board for possible rescinding. Upon motion of Dr. Bloom, it was voted that the Council should voice its objections to such a contract.

INTERNS AND RESIDENTS

The resolution on the action of the Council on Medical Education and Hospitals of the American Medical Association in changing the rating of a hospital in regard to interns and residents without prior notice to the hospital was discussed. It was pointed out that this resolution had been passed by the House of Delegates for presentation to the House of the A. M. A. Dr. Allee suggested that the wording of the resolution be changed and that supportive evidence be given him. Upon motion of Dr. Bohrer, it was voted that a modified resolution be prepared and presented to the American Medical Association.

RELEASE OF THE DEMOCRATIC COMMITTEE

The following release from the Publicity Division of the Democratic Committee, Washington, D. C., was read:

"A booklet explaining the Democratic Party's national health program is being distributed to Party leaders all over the country, William M. Boyle, Jr.,

Effective against many bacterial and rickettsial infections, as well as certain protozoal and large viral diseases.

AUREOMYCIN

Hydrochloride Crystalline



The Obstetrician is daily finding aureomycin an increasingly valuable agent for the prevention and treatment of infection. It may be given to advantage prophylactically in long and difficult labors and in all operative deliveries or infected abortions. Aureomycin not only attacks the maternal disease but also, by its passage in therapeutic concentrations into the placental circulation, treats possible infection in the child before and during birth. Aureomycin has proved its usefulness in endometritis, parametritis, urinary infection, infected thrombophlebitis and other infections, caused by a wide variety of organisms. Aureomycin is a drug indispensable to obstetric practice.

Packages

Capsules: Bottles of 25 and 100, 50 mg. each capsule. Bottles of 16 and 100, 250 mg. each capsule.
Ophthalmic: Vials of 25 mg. with dropper; solution prepared by adding 5 cc. distilled water.

LEDERLE LABORATORIES DIVISION
AMERICAN Cyanamid COMPANY
30 Rockefeller Plaza, New York 20, N. Y.

Chairman of the Democratic National Committee, announced today.

"The thirty-two page green and white booklet is entitled, 'Better Medical Care That *You* Can Afford.'

"The booklet points out that the program advocated by the President and the Democratic National Committee calls for: (1) More medical education; (2) More medical research; (3) More hospitals and health centers; (4) More local public health work; (5) More health protection for babies and children; (6) Application of the insurance principle to spread the cost of medical care and keep unexpected illness from becoming a financial disaster to millions of Americans.

"The booklet makes it clear that the balanced program, embodied in pending legislation and in proposals advocated by the President, Federal Security Administrator Oscar Ewing, Administration leaders and Democrats in the House and the Senate, is NOT, as opponents have sometimes charged, 'Socialized medicine.'

"The booklet also makes it clear that the patient would be free to choose his own doctor and the doctor would be free to accept or reject new patients and that the program would be locally administered.

"In announcing the distribution of the booklet, Chairman Boyle said: 'This inexpensive, factual presentation of the health program of the Democratic Party is deliberately devoid of the emotional arguments and of the distortions used by opponents of the measure in their multi-million dollar campaign of opposition. It reflects our confidence that the people are more interested in facts than in name-calling when they make up their minds in this important issue which affects every American Citizen.'

"The booklet is attached."

LEGISLATION

Mr. O'Brien reported that H. R. 6000, regarding total and permanent disability benefits had been amended by the Senate Committee to strike out Section 7 which was opposed by the American Medical Association; that no action had been taken on the school health bill, S. B. 1411, nor on S. B. 1453, dealing with medical education.

CORONER SYSTEM

Dr. Buhler informed the Council that the Missouri Society of Pathologists is working on a bill to be presented in the legislature to do away with the present coroner system and establish in its stead a medical examiners system.

KESSLER TESTIMONY

Dr. Mueller read from the report of the Washington office of the American Medical Association, giving testimony presented by Dr. H. H. Kessler, before a House Committee which was detrimental to the medical profession and professed that he spoke representing the American Medical Association. Dr. Mueller also read correspondence between the president of the St. Louis Medical Society and Dr. Lawrence and Dr. Henderson attempting to determine why such testimony was allowed, but which gave no clarification. Upon motion of Dr. Virden, the office was instructed to investigate this further.

MEETING OF SEPTEMBER 16-17

The Council met at the Sheraton Hotel, St. Louis, on September 16, 17, 1950, with E. C. Bohrer, M.D., West Plains, Vice Chairman, presiding.

Those present were Drs. Donald M. Dowell, Chillicothe; W. F. Francka, Hannibal; Otto W. Koch, Clayton; J. F. Jolley, Mexico; R. W. Kennedy, Marshall; Victor B. Buhler, Kansas City; W. S. Sewell, Springfield; E. C. Bohrer, West Plains; Frank W. Hall, Cape Girardeau; W. A. Bloom, Fayette; C. Edgar Virden, Kansas City; H. E. Petersen, St. Joseph; C. E. Hyndman, St. Louis; R. E. Schlueter, St. Louis; F. T. H'Doubler, Springfield; Wallis Smith, Springfield; Robert Mueller, St. Louis; Buford G. Hamilton, Jefferson City; Mr. Lemoine Skinner, St. Louis; Mr. D. E. Caywood, Springfield; Mr. John G. Miller, Mr. Raymond McIntyre and Mr. T. R. O'Brien, St. Louis.

CRUSADE FOR FREEDOM

Dr. Bloom read a letter from the Crusade for Freedom which explained the movement for a Free Europe and members present signed a scroll and contributed to the movement.

ST. LOUIS MEDICAL SOCIETY EXECUTIVE ASSISTANT

Mr. John Guy Miller, new Executive Assistant of the St. Louis Medical Society, was introduced to the Council.

STATE FAIR EXHIBIT

Mr. McIntyre reported on the exhibit at the Missouri State Fair which was sponsored by the Committee on Health and Public Instruction. He explained that the exhibit was one of ten in a group arranged by the Missouri Health Council and was located in the Educational Building. He said that approximately 5,000 pieces of literature furnished by the Educational Campaign of the American Medical Association were distributed. A picture of the exhibit was shown. Exhibits by the Association were discussed by Drs. Dowell, H'Doubler and Bloom and on motion of Dr. Bloom it was recommended that the Committee on Health and Public Instruction consider a larger exhibit for next year.

NATIONAL CANCER HOSPITAL

A letter from the Better Business Bureau was presented which explained that a campaign being carried on for funds for a National Cancer Hospital in Detroit had been investigated by the Bureau and that such a hospital did not exist.

CARE OF THE INDIGENT

The action of the Council in regard to Dr. Hamilton's request that there be more adequate medical care of the indigent in the state was reviewed. Dr. Buhler reported that the committee appointed had met but that no working plan had been forthcoming, principally because there was not sufficient instruction to the committee as to its duties. Dr. Buhler explained that it had been suggested that the Sixth Councilor District be the first objective. After discussion by Drs. Kennedy, Virden, Sewell, Bloom, Dowell and Petersen, it was decided that the issue must be made clearer and that then an understanding of it by physicians in the various areas was necessary before any constructive work could be done. It was suggested also that information be obtained about all individual county indigent care programs now in operation. Upon motion of Dr. Bloom, the matter was referred back to the committee for further study and further conference with Dr. Hamilton.

PROCUREMENT AND ASSIGNMENT

Mr. O'Brien reviewed the confusion that had occurred in connection with the appointment of a chairman for the state in Procurement and Assignment, whether the prerogative was with the Governor of the State, the American Medical Association, the Missouri State Medical Association or federal. It was reported that because of this confusion, the officers of the Association responded to a request that the Association submit three names to the American Medical Association for selection of a chairman. The Council approved this action of the officers. It pointed out that Dr. Robert Mueller originally had been appointed by Dr. Hamilton as chairman on Civilian Emergency Defense in Missouri. Dr. Mueller resigned this appointment and ac-

cepted the work of chairman for the state in Procurement and Assignment until such time as this became official.

The calling of physicians into service was discussed in connection with information from the Fifth Army Headquarters, the recently enacted Physician-Draft bill (digest published in the October issue of THE JOURNAL), releases from the Department of Defense in Washington and the experience at present in the state. A recent meeting in Chicago of officers of state associations was reported by Drs. Bloom, Petersen and Mueller. It was reported that they were told by military men that one reason for the seemingly illogical calling of men was that the new law could not become effective for at least ninety days and that "the Army needed physicians yesterday, not tomorrow."

Upon motion of Dr. Virden, it was voted that the Council petition the American Medical Association immediately to set up machinery to clear up the situation and that it be pointed out to the Secretary of Defense the confusion and injustices occurring in the calling of men. Dr. Mueller discussed the work and the limitations of Procurement and Assignment, pointing out that it had no legal status and that it was merely advisory and that the military administration was not obligated to accept its advice. (Explanation published in the October issue of THE JOURNAL.)

CIVILIAN MEDICAL DEFENSE

It was reported that much of the meeting in Chicago was devoted to Civilian Defense but discussion on this was deferred until Dr. Carroll P. Hungate, Kansas City, could be present on Sunday.

On motion of Dr. Buhler, Dr. Hungate was appointed chairman of the Association's committee on Emergency Civilian Medical Defense.

COMMITTEE ON CONSTITUTION AND BY-LAWS

Mr. O'Brien reported that there has been a meeting of the Committee on Constitution and By-Laws and that the committee was working on a report to the House of Delegates. He presented a bill for legal work done prior to the last session which the committee recommend be paid. On motion of Dr. Petersen, the bill was approved.

TREASURER'S REPORT

Dr. Hyndman reported on the finances of the Association and suggested that discussion be delayed until the November meeting of the Council when the budget for 1951 would be discussed. His report was accepted.

PROGRAM FOR 1951 ANNUAL SESSION

Dr. Buhler presented a résumé of the program for the 1951 Annual Session. He reported that color television again would be sponsored by Smith, Kline and French and that television would be presented each morning of the session on surgical subjects, followed by presentation of addresses by out of state speakers; each afternoon medical subjects would be presented in the first part of the session, followed by papers by out of state guest speakers. The program was approved.

Dr. Buhler announced that subsequent to previous action of the Council, technologists had been invited to meet at the same time as the Association and that this would be decided at a meeting of technologists in October. Dr. Buhler asked advice of the Council in inviting secretaries and assistants in physicians' offices to meet or attend the session. After discussion, this was left by motion to the discretion of the program committee to decide after consideration of what program might be arranged for them.

Dr. Buhler said that the Missouri Heart Association wished to meet on the Sunday prior to the Association meeting and wished approval of their meeting, also if possible financial assistance in a speaker for the meeting. It was decided that the Association should not give financial help but should approve the meeting.

FIELD SECRETARY'S REPORT

Mr. McIntyre reported that the following meetings would be held this fall: Councilor District afternoon and evening meetings of the 10th District at Cape Girardeau on October 5; 1st District at Maryville on October 9; 2nd District at Hannibal on October 19; 5th District at Columbia on November 2; 9th District at Lebanon on November 2; 8th District at Mount Vernon on November 9; 6th District at Sedalia on November 30. Missouri Academy of General Practice evening meetings in cooperation with Washington University School of Medicine at Springfield on September 14 and 28, October 19 and 26, and at Sikeston on October 19, November 9, and December 7 and 14; in cooperation with the University of Missouri School of Medicine at Chillicothe on September 14 and 28, October 26 and November 9; in cooperation with St. Louis University School of Medicine at both Hannibal and Jefferson City on September 14 and 28, October 26 and November 9; in cooperation with the University of Kansas School of Medicine at Nevada and Sedalia on October 19, November 2 and December 7 and 14. He announced that the Missouri Health Council will meet in Jefferson City at the Governor Hotel on October 4 with the principal subject being "School Health" led by Mr. John Bracken of the Clayton school system.

Mr. McIntyre reported that forty physicians had located in rural areas since the first of the year, making approximately 400 located in rural areas since the close of World War II.

A. M. A. DUES

Lists of physicians in each county who had not paid 1950 American Medical Association dues were given the respective Councilors. It was explained that in 1950 membership dues did not include the *Journal of the A.M.A.* but that in 1951 subscription to the journal would be included in the membership dues. Fellowship was discussed at the San Francisco session of the A.M.A. and the proposed continuation of fellowship with small dues will be acted on at the Cleveland Interim Session. It was pointed out that members would be dropped as of December 31, 1950, and that members who had not paid dues in 1950 would not be accepted as members in 1951 unless 1950 dues are also paid.

After discussion, the headquarters office was instructed to send bills for A.M.A. dues separate from those for county society and Association dues.

The following information on Service Fellows from the A.M.A. was read: "A Service Fellow is not required to pay the 1950 membership dues of $25.00 to the American Medical Association unless he is, in addition to being a Service Fellow, also a member of a component county and constituent state medical association. Service Fellowship does not require membership although some Service Fellows have elected to be both."

A. M. A. ADVERTISING CAMPAIGN

Material which the A.M.A. is using in connection with the nationwide advertising which will appear in newspapers and magazines on October 11 was presented by Mr. Skinner. He said that the response essentially was good and that newspapers were asking for additional kits which were being furnished. He pointed out that newspapers were selling additional tie-in advertising but that this would not influence editorial expression in many cases. He said that county medical societies would be asked in many cases to advertise and that there were two angles to this: one, that they had already contributed in making the A.M.A. advertising possible, the other, that an advertisement would put them on record with many businesses as opposing socialized medicine.

LEGISLATION

Mr. O'Brien pointed out that there will be seventeen members of the Missouri Senate elected at the November election and 154 members of the House. He said that he felt there would be much legislation in this session in which the Association would need take action. The progress and final killing of a hospital licensing law in the last session was reviewed and it was decided that such a law should be studied for possible introduction in the next session.

Dr. Hamilton announced a meeting on October 18 with the Board of Medical Examiners and others when this would be discussed.

COUNCILOR DISTRICTS

Dr. Dowell reported for a committee appointed to study redistricting because of convenience of some counties meeting with counties in another district. The committee recommended that Ray County be transferred from District 1 to District 6 and Linn County from District 2 to District 1. Upon motion of Dr. Petersen, the Council was instructed to present this recommendation to the House of Delegates.

MEMBERSHIP QUESTIONNAIRE

Information for the use of Procurement and Assignment Service and for Councilors was discussed. It was felt that full information was needed on all physicians in the state such as was obtained by the Committee on Medical Preparedness prior to World War II. After discussion it was decided upon motion of Dr. Hall that the Association should send out a questionnaire to all physicians in the state.

CIVILIAN MEDICAL DEFENSE

Dr. Petersen reported further on the meeting on Civilian Defense which was held September 10 in Chicago. He pointed out that physicians have only an advisory capacity in this work since it covers such a vast field as transportation, communications, water supplies, housing and many other phases. He said that local governments had the primary responsibility but that in case of disaster, various parts of the state would have to cooperate—a specific example might be where one town would require disaster relief which would be furnished by one or more other towns in the state—and therefore there is a statewide cooperative responsibility, the federal government's responsibility being less. Dr. Carroll P. Hungate was introduced and told of some of the work that was begun about nine months ago in Kansas City, an outline of which is to be presented to the city manager on October 1. He explained three phases of disaster work: The ordinary disaster is cared for by the Red Cross alone; disasters as tornado, floods require the aid of other groups such as the medical profession and assistance in housing; major disasters which require the assistance of the whole community and possibly adjoining communities. He explained that Civilian Defense must be planned on the basis of a major disaster and they are using the profession and allied groups to form teams for furnishing medical care. In this work older physicians who are not likely to go into service and especially general practitioners are forming the nucleus of these teams. He pointed out that this cannot be on a city basis since in Hiroshima there were thirty-six physicians of 239 alive after the bombing. Also, that as in Kansas City with some of the metropolitan area being in Kansas, states must work together. Dr. Hungate made it clear that a Civilian Defense program must be departmentalized with sections on various things, one of them being medical. He said that a survey for evacuation, feeding and housing has been made in Kansas City and that a location for a communications center is being sought not closer than seventy-five miles to Kansas City.

Dr. Hungate stated that a master plan which can be used as a guide for cities and counties would be made available within the near future.

On motion of Dr. Virden, it was voted that expenses of the committee members would be paid by the Association. Dr. Hungate was assured that he could call upon Councilors to assist in the work and that Mr. McIntyre would assist.

MEETING OF NOVEMBER 11-12

The Council met at the Sheraton Hotel, St. Louis, on November 11 and 12, 1950, with J. W. Thompson, M.D., St. Louis, Chairman.

Those present were Drs. Thompson, Donald M. Dowell, Chillicothe; W. F. Francka, Hannibal; Otto W. Koch, Clayton; J. F. Jolley, Mexico; R. W. Kennedy, Marshall; E. C. Bohrer, West Plains; Frank W. Hall, Cape Girardeau; W. A. Bloom, Fayette; C. Edgar Virden, Kansas City; H. E. Petersen, St. Joseph; C. E. Hyndman, St. Louis; R. E. Schlueter, St. Louis; R. O. Muether, St. Louis; Robert Mueller, St. Louis; Mr. D. E. Caywood, Springfield; Mr. John Guy Miller, Mr. T. R. O'Brien, Mr. Ray McIntyre and Mr. Lemoine Skinner, St. Louis. In addition on Sunday, the following attended: Drs. W. L. Allee, Eldon; Howard B. Goodrich, Hannibal; Victor E. Scherman, St. Louis; Buford G. Hamilton, Jefferson City; S. Souter Smith, Springfield; Curtis H. Lohr, St. Louis.

TESTING VISION OF SCHOOL CHILDREN

A letter from C. Souter Smith, M.D., Springfield, Chairman of the Committee on Conservation of Eyesight, was read outlining a program of the Committee for the testing of eyesight of school children in Missouri with the cooperation of the Department of Education. The Committee asked for an appropriation for the work. The letter stated that a member of the Committee would be available to answer questions and Robert D. Mattis, M.D., St. Louis, spoke briefly and answered questions on the work. The request was held for referral to the Budget Committee, which approved the appropriation.

RESOLUTION FROM DRUGGIST'S ASSOCIATION

A letter enclosing a resolution from the St. Louis Drug Association was read which asked the cooperation of the Association in the matter of physicians employing druggists and interfering with the free practice of pharmacy. This was discussed by Drs. Thompson, Kennedy, Petersen, Virden, Bohrer and Mr. McIntyre, which brought out some criticism of physicians and druggists. It was decided that since the St. Louis Medical Society has a committee that is studying this and the principal problem being in St. Louis, that the Association should take no action on it.

MID-CENTURY WHITE HOUSE CONFERENCE

An announcement of the Mid-Century White House Conference on Children and Youth was read in which the Association was asked to send representatives. A similar conference has been held at the end of every decade, called by the President or his representative, this one being called by Mr. Oscar Ewing, F.S.A. Administrator. Mr. McIntyre gave some data on the meeting which he had received from Dr. Garner of the Division of Health pointing out that there are certain definite delegates from the state, among whom are Dr. Garner, Dr. Margaret Gildea, Dr. Joseph Jaudon and Dr. Maddux of the Division of Health. After discussion and on motion of Dr. Virden, it was voted that the Association have a representative attend the Conference and report back to the Council, also asking Drs. Gildea and Garner to report on the meeting.

NATIONAL INSTITUTE OF PROFESSIONAL SERVICES

Material from the National Institute of Professional Services was presented and it was pointed out that some of the personnel which had been connected with the National Physicians Committee was promoting the work, that the material furnished was good and that physicians must use their own discretion as to what of such organizations they wished to support.

A. M. A. COORDINATING COMMITTEE

Mr. O'Brien read an announcement of the third annual conference of the coordinating committee of the A. M. A. National Educational Campaign which will be held on December 7. Upon motion of Dr. Virden, Drs. Bloom and Fries were designated to attend this. Dr. Virden was asked to furnish the name of a Kansas City physician who would also be appointed to attend the conference.

BUDGET COMMITTEE

The Chairman appointed the following Budget Committee: Drs. Hyndman, chairman; Bloom, Virden, Petersen and Jolley.

REPORT OF FIELD SECRETARY

Mr. McIntyre reported on work conducted since the last Council Meeting which included Councilor District meetings of the First, Second, Fifth, Eighth, Ninth and Tenth Districts and announced a meeting of the Sixth District for November 30 and of the Fourth District for December 7. He told of medical forums that are being held in the state including Kansas City, Springfield, St. Joseph and Cape Girardeau and announced that one would be held in St. Louis on November 27. He also reported on the number of speakers that have been furnished for county society meetings. He told of the meetings that have been held throughout the state by the Missouri Academy of General Practice. He reported on the Missouri Health Council and a meeting in Detroit at which "M. D. Participation" was discussed. The lack of cooperation of physicians in the work of the fifty-five local health councils and the Missouri Health Council was discussed. Mr. McIntyre was asked to get the personnel of each council and in those cases in which no physician was active, a letter to the county society over the signature of Dr. Bloom should ask that a physician be appointed to interest himself in the local council.

A. P. H. A. SURVEY

Mr. McIntyre said that Dr. Hamilton had asked that a committee be appointed to cooperate in a survey to be made by the American Public Health Association of the Missouri Division of Health. On motion of Dr. Virden, it was decided that Dr. Royce Bohrer, Jefferson City, be asked to serve from the Association on a committee of the Missouri Health Council to be in close contact with the survey and report to the Council.

TREASURER'S REPORT

Dr. Hyndman reported briefly stating that fuller information would be presented on Sunday by the Budget Committee.

PUBLIC RELATIONS

Dr. Fries reported on the work of the Committee on Public Relations and the expenditures and recommended that this committee be made a committee of the Council. This was discussed by Mr. Skinner, Drs. Bloom, Petersen, Dowell, Virden, Francka and Thompson. It was decided that the committee should remain a separate committee but that the chairman should attend all Council sessions.

JOINT COMMITTEE FOR IMPROVEMENT OF CARE OF THE PATIENT

The work of the joint committee of physicians, hospitals and nurses, which is made up of three representatives from each field was reviewed. Meetings have been held on July 7 and October 24. Items for discussion at the next meeting in January will be the Hess report and the standardization of hospitals and setting up of units on general practice in various hospitals. The situation of the American College of Surgeons considering giving up the approving of hospitals and then going ahead with this work was discussed. Various difficulties dealing with anesthesia, x-ray and pathology in hospitals were discussed. It was pointed out that only one person, Dr. Paul Johnstone of Kansas City, had been appointed on this committee and on motion of Dr. Bloom, the Chairman was asked to appoint two more members. The presidents, executive secretaries and editors of each group will be ex officio members of the overall committee.

WASHINGTON A. M. A. OFFICE MEETING IN OMAHA

A meeting of representatives of seven or eight states called by the Washington Office of the A. M. A. in Omaha on November 15 was announced.

LEGISLATION

Mr. O'Brien gave a brief review of the legislative situation in Missouri and stated that a list of all national and state members of legislatures would be sent each member of the Association.

WORLD MEDICAL ASSOCIATION

Dr. Goodrich reported on the recent meeting of the World Health Association meeting which he had attended. He said that the two main purposes of the Association were correlation of scientific teaching and work of the various countries and the creation of personal understanding between doctors of the forty-one countries in the Association.

VOLUNTARY ADVISORY COMMITTEE TO SELECTIVE SERVICE

Dr. Mueller spoke briefly on the work of the Advisory Committee to Selective Service System and answered questions. He asked that committees be set up immediately in all Councilor Districts and that he be given the personnel so that he could give it to the Selective Service System. He stated that the Selective Service System wished to work with these advisory committees. He said that the National committee was starting a study of residents in hospitals in order to make specific recommendations. He said that deferments should be based on civilian need, teaching and industrial. Dr. Dowell asked that the Councilor District committees be notified by the state office of their appointment.

REPORT OF BUDGET COMMITTEE

The Budget Committee reported that the income of the Association was not adequate to cover the expenditures and that some means of overcoming this was necessary: cutting into the reserves of the Association, raising the dues or placing a temporary assessment. It was pointed out that this was necessary especially in view of the curtailment of income from dues in view of the war situation, that fewer new members would be available and that the dues of many members may be waived because of military service. The Committee recommended that the council recommend to the House of Delegates that a $10.00 assessment be placed on members for the year 1951. On motion of Dr. Francka, this was passed.

Dr. Virden moved that the dues of men going into service be waived but that provision be made by amendment of the by-laws to care for this situation permanently. This was passed.

The following budget for the year 1951 was adopted by the Council for submission to the House of Delegates:

Salaries	$29,000.00
Journal Expense	20,000.00
Postage and Express	500.00
Printing and Stationery	1,800.00
Travel, Executive Secretary	900.00
Travel, Field Secretary	1,500.00
Telephone and Telegraph	1,200.00
Office Rent and Light	3,000.00
Meeting and Com. Expense	12,400.00
Defense	500.00
Scientific and Postgraduate	1,000.00
Woman's Auxiliary	500.00
Public Relations	4,500.00
Insurance Annuity	950.00
Miscellaneous and General Expense	1,500.00
Furniture and Fixtures	250.00
Social Security Tax	425.00
Total	$79,925.00

REPORT OF DELEGATES TO A.M.A.

Drs. Allee and Goodrich reported briefly on the San Francisco session of the A. M. A. Drs. Thompson and Lohr reported on meeting with the reference committee concerning the approving of hospitals for intern training. The allocation of interns and residents to hospitals, especially in connection with Procurement and Assignment activities, was discussed. It was suggested that the delegates be asked to prepare and present a resolution to the House of Delegates toward this end. After discussion in which it was pointed out that work is being done along this line, upon motion of Dr. Virden it was decided that such a resolution should be given the delegates for use at their discretion.

CIVILIAN DEFENSE

Civilian Defense was discussed by Dr. Hamilton, Dr. Lohr and Mr. O'Brien. Outlines prepared by Dr. Hungate and Dr. Hamilton on proposed plans for the state were presented. Dr. Lohr presented the plan that is being worked out in St. Louis County. Dr. Lohr was asked to make the outline available to the Council and the Civilian Defense Committee.

MEETING OF JANUARY 13-14

The Council met at the Sheraton Hotel, St. Louis, on January 13 and 14, with J. W. Thompson, M.D., St. Louis, Chairman, presiding.

Those present were Drs. Thompson, W. F. Francka, Hannibal; Otto W. Koch, Clayton; J. F. Jolley, Mexico; R. W. Kennedy, Marshall; W. S. Sewell, Springfield; Frank W. Hall, Cape Girardeau; Donald M. Dowell, Chillicothe; Victor B. Buhler, Kansas City; W. A. Bloom, Fayette; C. Edgar Virden, Kansas City; H. E. Petersen, St. Joseph; C. E. Hyndman, St. Louis; R. E. Schlueter, St. Louis; Howard B. Goodrich, Hannibal; Victor E. Scherman, St. Louis; Armand D. Fries, St. Louis; Buford G. Hamilton, Jefferson City; R. O. Muether, St. Louis; Carroll P. Hungate, Kansas City; Curtis H. Lohr, St. Louis; Lynn M. Garner, Jefferson City; Paul N. Johnstone, Kansas City; William H. Bailey, St. Louis; Ralph E. Duncan, Kansas City; Senator John Noble, Kennett; Mr. Lemoine Skinner, St. Louis; Mr. D. E. Caywood, Springfield; Mr. W. H. Bartleson, Kansas City; Mr. John Guy Miller, St. Louis; Mr. Ray McIntyre and Mr. T. R. O'Brien, St. Louis.

The minutes of the last meeting were approved as sent to the Councilors.

MEDICAL EDUCATION FOUNDATION

Mr. O'Brien called attention to the Medical Education Foundation created recently by the American Medical Association, saying that it was chartered this last December and that a survey would be made to determine what schools needed grants. He pointed out that a resolution introduced by Missouri Delegates perhaps assisted in the establishing of the Foundation.

COLLEGE OF RADIOLOGY

Dr. Virden presented information on a course to be presented in Chicago on February 10 on the radiologic aspects of civilian defense by the College of Radiology. It was decided that representation from the Council should be present at this course and it was suggested that Drs. Bloom and Hungate attend it.

TREASURER'S REPORT

The Treasurer reported that the Association was in fair financial condition but that a full statement would be available as soon as the books could be audited. The report was accepted.

IMPROVEMENT OF CARE OF PATIENT

Mr. O'Brien outlined the development of the Missouri Conference for the Improvement of the Care of the Patient, being prompted by the nurses' organization at a national level and in Missouri being composed of representatives of the Missouri State Medical Association, the Missouri State Nurses Association and the Missouri Hospital Association. The first annual session will be held in the near future and some suggestions were made concerning the Conference articles that had been submitted. It was decided that definite action would be awaited until Dr. Paul N. Johnstone, Kansas City, one of the Association representatives, would arrive and report.

FIELD SECRETARY'S REPORT

Mr. McIntyre reported on county, Councilor District and special meetings that had been held since the last Council meeting. He reported that three health forums were scheduled for this spring. He also announced the February 13 meeting of the Missouri Health Council in Jefferson City. A brief report on the Public Relations Conference of the American Medical Association was given. Mr. McIntyre announced that hospitals at Rolla, Kennett and Perryville would soon be in operation and that the one in Pemiscott County would follow in the near future. Fifty-five physicians have located in rural Missouri during the last year, making the total more than 400 since the close of the war. The present situation on physicians in rural areas was discussed but no conclusions were drawn.

A.M.A. DUES

Mr. O'Brien reported on the dues of the A.M.A. which had been paid by Missouri physicians, saying that Missouri stood twenty-seventh in the order of the states but that several states had paid about the same proportion. He explained that dues for 1951 would be $25.00, payable to the A.M.A. through the Association office and that this included subscription to *The Journal of the A.M.A.* He mentioned that members will be billed directly in a short time. He pointed out that exemptions were made only for hardship cases, interns and retired members.

WHITE HOUSE CONFERENCE

Dr. Lynn Garner, Jefferson City, who attended the White House Conference on Children and Youth held recently in Washington, D. C., reported on the Conference. He stated that the principal theme of the conference was "How to develop in children the mental, emotional and spiritual qualities essential to happiness and good citizenship." Recommendations from the conference were that nursery schools be a part of the public school system, that migratory and seasonal workers' children have attention, local attention to children because of the national mobilization and improvement and increase of facilities in professional schools for services to children.

PUBLIC RELATIONS

Dr. Fries reported briefly on a questionnaire that had been sent to all state secretaries to determine the proportion of public relations work that was done. All returns were not in and no general tabulation was given. He stated that dues of Associations that had answered ranged from $15.00 to $50.00.

IMPROVEMENT OF CARE OF PATIENT

Dr. Johnstone reported on the meetings that have been held by the Conference for the Improvement of the Care of the Patient, following the discussion on the same subject in the morning session. This was discussed by Drs. Schlueter, Virden, Bloom and Johnstone. Upon motion of Dr. Bloom, the Committee was asked to attend the conference without authority to act before receiving approval of the Council.

FOUR YEAR SCHOOL

It was checked to be sure that all members had copies of the Diehl survey, the majority and minority reports of the committee of the Board of Curators. Dr. Glenn W. Hendren, sponsor of the minority report, was unable to attend the meeting. Two letters concerning the situation were read. A short discussion followed.

LEGISLATION

Mr. O'Brien pointed out that the Legislature had just convened for the 1951 session and that officers and some committees had been appointed. He said that the Legislature would be mostly concerned with appropriation bills presented by the Governor through the first part of the session.

MENTAL HEALTH

Mr. O'Brien told of a meeting on mental health, called by the Social Planning Council, but participated in by several groups. In discussion it was brought out that there is a mental hygiene organization in the state and that this might be used by these interested groups. Upon motion of Dr. Petersen, this matter was left to the discretion of the Executive Secretary and the Chairman of the Council. Upon motion of Dr. Kennedy, the Council went on record expressing endorsement of Dr. Hamilton's Department for appropriating funds for the care of the mentally ill throughout the state.

INTERN AND RESIDENT MEETINGS

The meetings that have been held in Kansas City and St. Louis each spring to acquaint interns and residents with various phases of rural practice were discussed and on motion of Dr. Kennedy, it was decided to discontinue these meetings until such time as it would be appropriate to reestablish them.

ANNUAL SESSION

Dr. Buhler reported that the program for the Annual Session and practically all arrangements had been completed. He said that it was felt that the Tuesday evening entertainment should be abandoned this year, which was approved by the Council.

WOMAN'S AUXILIARY

Dr. Virden presented a request from the Woman's Auxiliary for $200.00 to assist in defraying expenses of their annual session. Upon motion of Dr. Virden, this was granted.

CONFERENCE OF PRESIDENTS

Upon motion of Dr. Bloom, the Council voted to send $50.00 for the Conference of Presidents, as has been done annually for some years.

PROCUREMENT OF PHYSICIANS

Dr. Buhler, who had just returned from a meeting in Washington, D. C., concerning the procurement of physicians, reported. He said that the names of registered physicians will be sent to all Councilors within a short time. He reviewed the category of physicians being called into service and advised that it was best to handle any questions at the Selective Service level. He said that it had been decided by the Army Surgeon General that 3.49 medical officers were needed for each 1,000 men.

AUDRAIN COUNTY SUIT

Mr. John Noble, Kennett, attorney, discussed the Audrain County suit and said that an appeal has been taken to the Missouri Supreme Court, that the hearing may be held in May in which case a decision might be expected in July.

CIVILIAN DEFENSE

Dr. Hungate presented a report on the progress of the work on the medical phase of civilian defense, showing charts and outlines on the work, which will be presented to all members as soon as possible. Upon motion of Dr. Virden, $1,000 was placed at the disposal of the Committee on Civilian Defense with the request that Dr. Hamilton, as state chairman, repay this when possible. Dr. Lohr gave the plan that has been worked out by St. Louis County for civilian defense, illustrating by a large chart. Dissemination of the knowledge of the work that is being done was discussed and upon motion of Dr. Virden, it was decided that Mr. Skinner be asked to work with Dr. Hamilton toward the contacting of newspapers and the releasing of information to all newspapers in the state at the same time, full information on medical civilian defense.

EMIC

Dr. Hamilton asked the opinion of the Council on the reestablishment of the EMIC program. He was asked to refer material to the Committees on Maternal Welfare and Infant Care for their recommendations to the Council.

REPORT OF A.M.A. DELEGATES

Drs. Goodrich and Schlueter reported on the December session of the A.M.A. They reported that after December 31, 1951, the number of delegates to the A.M.A. would be determined by the number of members of the A.M.A. in a particular state. A new section on Military Medicine was reported. The A.M.A. Interim Session in 1953 will be held in St. Louis.

J. W. THOMPSON, Chairman.

J. W. THOMPSON, M.D., St. Louis: The Council wishes to report to the House of Delegates regarding several matters referred to it by the House of Delegates at the 1950 Annual Session.

1. A resolution approved by the House of Delegates relating to the so-called "Comprehensive Hospital Plan" which was approved by the Board of Trustees of the St. Louis Blue Cross Plan early in March 1950 requested that action be taken to urge the St. Louis Blue Cross Plan to reverse its decision. Copies of the resolution were sent to the Blue Cross Plan by the executive office, following which the Board of Trustees of the Blue Cross Plan did reverse its action. The Board then referred the "Comprehensive Steel Contract" to a special committee of the Trustees for further study. The special committee has taken no action in this matter up to the present time. In the meantime, negotiations have proceeded so that arrangements for handling benefits such as x-ray, pathology, anesthesia and physiotherapy might be made with Missouri Medical Service, our prepayment medical care plan. At the present time, however, it is not likely that the comprehensive hospital contract embodying the medical services just outlined will be considered at all. This is due to the fact that costs of hospital services are rising so rapidly during our

present inflationary trend that the Blue Cross plans are devoting their full attention to purely hospital problems.

2. A resolution relating to the establishment of a "Grievance Committee" was referred to the Council for further consideration. A bulletin was sent to all county societies on August 25, 1950. The bulletin gave the complete text of the resolution adopted by the House, explained that individual societies already have the framework set up to handle any disputes which might arise and stated that in the event a complaint might be beyond the scope of a county society, that the complaint should then be referred to the Council for consideration. Up to the present time, no complaints have been received for review and only one letter has been received from a county society.

The Council committee has studied the report of the A.M.A., known as "Medical Society Grievance Committees," and also the progress report of a special committee in Pennsylvania. The Pennsylvania committee disapproved of the idea of a state wide grievance committee, recommending instead that the county societies activate such programs and bring them to the attention of the public. They further pointed out that the establishment of such a committee at the state level would further undermine the autonomy of the county society. Shall power and control come from the grass roots or be imposed upon them? In view of the fact that no problems have been presented to the Council, it is recommended that nothing further be done about setting up a committee on grievances until such a time as it would pose a problem to the county societies and the Association.

The Council desires to call your attention to the booklet "Reports of Officers and Committees." You will note that all but two of the Association's committees have made reports. We strongly urge that these reports be read carefully so that you will have knowledge of the many important activities of the Association. At the same time it is desired to commend the committee members for the faithful discharge of their duties.

The Council wishes to call to your attention several items which are included in the published report as well as other actions taken at the meeting of this morning. These are:

1. On page 48 of the published reports of officers and committees you will find a resolution recommending that slight alterations be made in three of the present Councilor Districts:

Whereas, The By-laws in Chapter III, Sec. 6, page 7, provide that the House of Delegates shall divide the state into Councilor Districts specifying what counties each district shall include, and

Whereas, The Linn County Medical Society of Councilor District 2, by vote of its members desires to hyphenate with the Caldwell-Livingston County Medical Society of Councilor District 1, which society has likewise agreed to such a change, and

Whereas, The Ray County Medical Society of Councilor District 1 by vote of its members wishes to hyphenate with the Lafayette County Medical Society of Councilor District 6, which county society has likewise approved of such hyphenation, and

Whereas, These changes will facilitate the work of these societies and stimulate the scientific interest of the members thereof, therefore be it

Resolved, That the House of Delegates approve of these changes in Councilor Districts so that new charters may be granted to the newly hyphenated county societies.

2. On page 53 of the reports you will find the report of the Budget Committee of the Council. The Council would like to point out that the expenses of the Association exceeded income during 1950 in the amount of $13,112.38. Anticipated income during 1951 is expected to decline further because fewer new members will be available and the dues of many members may be waived because of military service. In order to keep alive our programs, continue our policy of expanded county, hyphenated county and councilor district postgraduate meetings, increased activities in the line of public relations and efforts to increase the interest of the members in prepayment plans, our revenue is of major importance. Your attention is called to the report of the Committee on Public Policy on page 8 of the Reports wherein a summary is given of the dues of other state medical associations. You will note that the annual dues of Missouri, $15.00 annually, are lower than all but five states and those five states charge the same amount. The Council recommends, therefore, that an assessment of $10.00 in addition to the dues of $15.00 be approved by the House of Delegates and that the assessment be made retroactive to January 1951.

3. The Missouri Society of Pathologists has called attention to the fact that the Missouri State Board of Health Laboratory is now legally compelled to render laboratory diagnoses and other services which are not of a public health nature. This is contrary to the principles of medical practice and is leading to socialized medicine. If this is corrected the members of the Missouri Society of Pathologists agree to render necessary diagnostic laboratory services without charge on material referred from patients unable to pay for this medical service.

The Missouri Society of Pathologists will aid in promulgation of legislation designed to limit the activities of the Missouri Division of Health Laboratories to public health laboratory service. The Council commends the members of the Missouri State Medical Association who are members of the Missouri Society of Pathologists for this action and urges that the personnel of the Missouri Division of Health Laboratory may confine their funds and procedures to the purposes of public health.

4. It has been called to the attention of the Council that the State Board of Medical Examiners is unable because of insufficient funds to follow up and successfully prosecute persons who practice medicine illegally in this state. At present the Board is dependent upon the collection of fees for its income. These members of the Board serve without compensation other than expenses and have the power to grant licenses to practice medicine as well as to revoke or suspend such licenses. The fees presently charged are: New applicant $15.00; reciprocity $50.00; biennial registration $1.00. It has been suggested that these fees be raised to the following amounts: $25.00, $100.00 and $5.00.

In order to do this a legislative act is required. Therefore, the Council recommends that the necessary legislation be prepared and submitted to the present session of the Missouri legislature and that all members be urged to support the passage of such a change in the law.

5. The Council wishes to call to your attention the recent bulletin of the Community Health League which included a list of all state and national legislators. Please preserve this for future use.

6. The American Medical Association adopted a report of the Committee on Hospitals and the Practice of Medicine, known as the "Hess Report." This report contained the following recommendation: "Each component medical society and each constituent state and territorial medical association appoint a committee on Hospital and Professional Relations." This recommendation in order to be carried out requires a change in our by-laws, therefore, the following amendment is submitted:

Amend the By-laws, Chapter VII, Sec. 1, by adding the following at the end of the list of Committees, "A Committee on Hospital and Professional Relations" so that the section will read: "Section 1. The standing Committees of this Association shall be as follows:

"A Committee on Scientific and Postgraduate Work.

. . . .

"A Committee on Hospital and Professional Relations, etc."

The contract with the Veterans Administration for care of veterans was approved by the Council for renewal in June 1951 but the Council feels that the contract and procedures should be studied prior to the time of renewing it in 1952.

The Council authorized the Treasurer to convert one $10,000.00 bond to help defray the deficit for 1950.

The following resolution concerning the four-year medical school of the University of Missouri was adopted by the Council and is presented to the House of Delegates:

WHEREAS, The Missouri State Medical Association has recognized for many years the importance of re-establishing within the state university a four-year medical school, and

WHEREAS, The Association has worked to achieve better public understanding of the need for this school to give increased opportunity to young Missourians to enter the practice of medicine, and, in particular, to contribute to the number of doctors available to serve residents of the state —especially in rural areas, and

WHEREAS, The Association has financed and taken part in studies relating to the means by which a state university medical school might most effectively be established to serve the people of the state. Now therefore be it

Resolved, That this House of Delegates commend the Board of Curators of the University of Missouri for its recent action in re-affirming its intention to proceed with the establishment of this much-needed school, and be it further

Resolved, However, that this Association views the decision of the Curators to locate the school in Columbia as a step taken against the consensus of competent medical opinion in the matter, and be it further

Resolved, That this Association re-affirm its view, based on expert opinion and long study, that the natural home of a medical school in a metropolitan area, and that for Missouri to ignore this fact is to invite very great disadvantage for the future, including

(a) Initial costs of establishing the school far higher than are necessary.

(b) Similarly unnecessary high costs of operating the school each year. Requiring new taxes, which would not be needed if the school were established in a metropolitan location.

(c) Failure to make the best use of the state's resources in the fields of clinical teaching and of teaching patients with the probable consequences that a school in Columbia will operate under a great initial handicap and that this handicap will increase as time goes on.

(d) The fact that hospital construction made necessary by the Columbia location will seriously drain Federal funds available to the state and will, in consequence, retard the development of hospital construction in many rural areas now clearly in need of such facilities, and

(e) The emphasis on a state-wide welfare program for indigent patient care, which is an integral part of the plan to locate the school in Columbia, interferes with what ought to be the primary role of the school, namely, medical education. Be it further

Resolved, That this Association affirm its agreement with the conclusions reached by Glenn W. Hendren, M.D., member of the Board of Curators, in his minority report on this subject presented November 17, 1950, which report, in turn, was in our view, the logical conclusion to be derived from the data assembled by Harold S. Diehl, M.D., Dean of the Medical Sciences, University of Minnesota, appointed by the Board of Curators to make an objective study of the question, and be it further

Resolved, That the Association disseminate throughout the state reprints of all the reports on this subject as published in THE JOURNAL of March 1951.

Appointment of Committee on Nominations

W. A. Bloom, M.D., Fayette, President, announced the appointment of the Committee on Nominations as follows:

Paul L. Forgrave, St. Joseph.
B. L. Murphy, Hannibal.
L. R. Sante, St. Louis.
C. P. Dyer, St. Louis County.
F. D. Dean, Fayette.
R. C. Haynes, Marshall.
R. Lee Hoffmann, Kansas City.
Kenneth Glover, Mount Vernon.
C. F. Callihan, West Plains.
Paul Baldwin, Kennett, Chairman.

The House of Delegates recessed until 4:00 p.m. on Monday.

MONDAY, APRIL 23, 1951
Recessed Session

The recessed session of the House of Delegates convened at 4:00 p.m. on Monday, April 23, with F. T. H'Doubler, M.D., Springfield, Speaker, presiding.

Francis D. Dean, M.D., Fayette, reported for the Committee on Credentials that there were four Officers, ten Councilors and seventy-two Delegates registered.

Upon motion, duly seconded, the minutes of the Sunday session were approved as read by H. E. Petersen, M.D., St. Joseph, Secretary.

A. Denton Vail, M.D., Springfield, gave the report of the Reference Committee on Amendments to the Constitution and By-Laws.

REPORT OF THE REFERENCE COMMITTEE ON AMENDMENTS TO THE CONSTITUTION AND BY-LAWS

Many years ago a charter was granted this Association by the State of Missouri. In that charter among other things were listed the officers of the Association, the number of councilor districts, etc. In the years that elapsed after the granting of this charter certain changes were made in the constitution. The number of Vice Presidents was increased and the number of Councilors was diminished. All of these changes violated the provisions of the charter which had become outmoded. At the last meeting of the Association it was decided by the delegates that the matter of charter should be looked into and if deemed advisable an amended charter should be asked for. This matter was referred to the standing Committee on Constitution and By-laws and Dr. Kane was asked to assist the Committee in its investigations and conclusions. This Committee completed this work together with a tentative draft of an amended constitution together with certain modifications of the by-laws for our Association. The Reference Committee has studied the report of the standing Committee and recommends:

1. That the House of Delegates authorize the Council to apply for the amended charter submitted by the Committee.

2. That the draft of the proposed constitution be accepted by the House of Delegates for publication in THE JOURNAL as required by law and for submission for action at the next meeting of our Association in 1952.

3. That the proposed amendments to the by-laws having been published as required by our laws, be adopted at this session of the House of Delegates.

With the adoption of the constitution and amendments at the session in 1952 the standing Committee will then prepare by-laws which will be in accord with the new instrument.

To carry out the recommendations of this Committee, I now move that the proposed changes in the By-laws lie on the table as required by Chapter XII, Section 1, for one day and that they be submitted to the House of Delegates for action at the last meeting of this session. I move the adoption of this report.

Upon second, the report was adopted.

DR. VAIL: Your Committee recommends the following changes in the By-laws as recommended by the Council:

Amend Chapter VII, Section 1, by adding after "A Committee on Scientific and Postgraduate Work" a new committee to be called "A Committee on Hospital and Professional Relations."

No other changes in this section are recommended.

I move that this proposed change in the By-laws

lie on the table as required by Chapter XII, Section 1, for one day and that it then be submitted to the House of Delegates for action at the last meeting of this session.

Upon second, the motion was adopted.

Dr. Vail: After due deliberation and consideration of the recommendations as presented in the report of the Committee on Public Policy and Public Relations, as published in the Report of Officers and Committees of the Missouri State Medical Association, the 93rd Annual Session, Kansas City, Missouri, 1951, pages 7 to 10 inclusive, it is the feeling of the Reference Committee that the relegation of the standing Committee on Public Policy and Public Relations to the status of a subcommittee of the Council would not be in the best interest of the Association.

Your Committee feels that it is desirable to maintain a formal Committee on Public Policy and Public Relations even though the policies and actions of this Committee are directed by the Council.

Your Committee recommends, however, that one member of the standing Committee on Public Policy and Public Relations be an elected member of the Council and accordingly recommends the following change in the by-laws:

Amend Chapter VII, Section 3, by eliminating the first sentence which reads "The Committee on Public Policy and Public Relations shall consist of three members; and the President and President-Elect and such other members whose experience suggests their value in emergency, to be called by the chairman of the committee" and substitute therefore this sentence: "The Committee on Public Policy and Public Relations shall consist of the President and President-Elect of the Association, one elected member of the Council and two members appointed by the President of the Association."

I move that the proposed changes lie on the table as required by Chapter XII, Section 1, for one day and that they be submitted to the House of Delegates for action at the last meeting of this session.

Upon second, this motion was adopted.

Durwood G. Hall, M.D., Springfield, gave the report of the Reference Committee on Resolutions.

REPORT OF THE REFERENCE COMMITTEE ON RESOLUTIONS

Mr. Speaker: In the first session of the House of Delegates of the Missouri State Medical Association in the 93rd Annual Session there was referred to the Reference Committee on Resolutions, on April 22, 1951, a resolution embodying a recommendation from the Council pertinent to the realignment of Councilor Districts and component societies thereof. This action is predicated upon the By-laws of this Association in Chapter III, Section 6, page 7.

The Reference Committee on Resolutions has met and considered the resolution. There is no objection to the resolution as presented, although the Committee feels that it should advise the House of Delegates that such action should always be reviewed with caution as befits the full responsibility of this organization because:

It could well affect the election of the Councilor for such districts under the last clause of Section 2, Chapter III, of the By-laws and could possibly be used to change the representative number of delegates in any district. This clause states: "provided, however, that each component society shall be entitled to at least one delegate or one corresponding alternate from each of the Counties from which it is composed." Perhaps this clause needs interpretation.

Inasmuch as Linn County and Ray County already have one delegate, this discussion is not pertinent to the resolution under consideration, but is simply brought before the House to point out that the sparsely populated counties, some of whom have no physician, may thus gain delegate representation with their hyphenated component societies, which could easily upset or throw into imbalance the present representative system of delegates upon which this House is founded.

Inasmuch, therefore, as none of the problems presented are involved in this resolution, it is recommended that it be approved by the House of Delegates as follows:

Whereas, The By-laws of the Missouri State Medical Association in Chapter III, Sec. 6, page 7, provide that the House of Delegates shall divide the state into Councilor Districts specifying what counties each district shall include, and

Whereas, The Linn County Medical Society of Councilor District 2 by vote of its members desires to hyphenate with the Caldwell-Livingston County Medical Society of Councilor District 1, which society has likewise agreed to such a change, and

Whereas, The Ray County Medical Society of Councilor District 1, by vote of its members wishes to hyphenate with the Lafayette County Medical Society of Councilor District 6, which county society has likewise approved of such hyphenation, and

Whereas, These changes will facilitate the work of these societies and stimulate the scientific interest of the members thereof, therefore be it

Resolved, That the House of Delegates approve of these changes in Councilor Districts so that new charters may be granted to the newly hyphenated county societies.

Upon motion, duly seconded, this resolution was adopted.

R. C. Haynes, M.D., Marshall, reported for the Reference Committee on Medical Education and Public Welfare.

REPORT OF REFERENCE COMMITTEE ON MEDICAL EDUCATION AND PUBLIC WELFARE

The Committee recommends to the House of Delegates that the resolution submitted by the Council approving the establishment of a four year medical school of the University of Missouri, to be located in a metropolitan area, be approved.

The Committee also recommends the adoption of the reports of the committees on Medical Education and Hospitals and Health and Public Instruction.

Upon motion, duly seconded, the report was accepted and the resolution adopted.

W. O. Finney, M.D., Chaffee, reported for the Reference Committee on Miscellaneous Affairs.

REPORT OF THE REFERENCE COMMITTEE ON MISCELLANEOUS AFFAIRS

The Committee on Miscellaneous Affairs conducted a hearing in Room 404, lasting about two hours.

The Committee recommends the adoption of the reports of the committees on Defense, Rural Medical Service, Emergency Medical Service, Mental Health, Tuberculosis and Maternal Welfare.

The Committee recommends the adoption of the Council's report as it applies to the assessment.

Ten thousand dollars of the reserve fund has been used to meet the deficit created by the various increases in the cost of work done and ordered by the Council and the Association. The anticipated income from the next year to meet a budget of $80,000.00 will leave a further deficit. The Committee does not recommend the expending of the reserve fund for the anticipated deficit. The Committee feels that the reserve fund should at all times be sufficient to represent one year's cost and should have on hand at least one year's income. Assessment will enable the Association to meet last year's and this year's deficits and restore the reserve fund to a desired level. Catastrophic experience would require a considerable re-

serve fund. The following costs of services have increased: printing of THE JOURNAL, stationery and postage, civilian defense expense, and there is anticipated further increases in cost of all items.

Upon motion, duly seconded, the report was adopted.

R. Lee Hoffmann, M.D., Kansas City, gave the report for the Reference Committee on Reports of Officers.

REPORT OF THE REFERENCE COMMITTEE ON REPORT OF OFFICERS

The Committee approves and recommends to the House of Delegates for action in behalf of the Board of Medical Examiners for proper legislative procedures to permit the following:

1. That biannual registration fee be increased from $1.00 to $5.00

2. That the examination fee be increased from $10.00 to $25.00.

3. That the reciprocity registration fee be increased from $50.00 to $100.00.

The enactments will make possible the employment of investigators and to enforce regulations against violations of the laws relative to the legalized practice of medicine in Missouri.

The Committee has examined and recommends to the House of Delegates the approval of the reports, previously printed, which were referred to this Committee as follows: Secretary, Executive Secretary, President, President-Elect, Arrangements, Treasurer, Scientific and Postgraduate Work, Publication, Cancer, Medical Economics, Infant Care, Fractures, Control of Venereal Disease, Conservation of Eyesight, Industrial Health, Anesthesiology, Physical Medicine, and part of the report of the Council.

Upon motion, duly seconded, this report was adopted.

DR. HOFFMANN: The Committee further recommends the following resolution:

WHEREAS, The special committee on alcoholism appointed by the Council of the Missouri State Medical Association has come to the conclusion that

a. Alcoholics are sick people;

b. The solution of the problem requires active participation on the part of the medical profession of Missouri;

c. The most effectual program directed toward the prevention of and arrest of alcoholism must be activated and maintained at local levels, and

WHEREAS, The Council urges the members of the Missouri State Medical Association to participate in the activities of adequately organized local groups to attack the problem of alcoholism, and

WHEREAS, The Council has recommended the creation of a Committee on Alcoholism, therefore be it

Resolved, That the President of the Missouri State Medical Association be directed to appoint an Advisory Committee on Alcoholism whose principle duties shall be to study the subject and advise various county societies who may interest themselves in the subject as to how they might operate the group most effectively.

Upon motion, duly seconded, the resolution was adopted.

Kenneth Glover, M.D., Mount Vernon, gave the report for the Reference Committee on Technical Exhibits.

REPORT OF THE REFERENCE COMMITTEE ON TECHNICAL EXHIBITS

The first award was won by Dumas-Wilson & Co., St. Louis; second by Eli Lilly & Company, Indianapolis, and third by A. H. Robins Co., Inc., Richmond, Va.

J. W. Thompson, M.D., St. Louis, presented the following resolution:

WHEREAS, Boys Town of Missouri has undertaken a program for rehabilitation of delinquent or near delinquent boys of the state, and

WHEREAS, This program is an important contribution to the solving of a problem of great importance to all Missourians, and

WHEREAS, The Missouri State Medical Association has been invited to cooperate in the program by encouraging member physicians to provide a medical check or physical examination for each boy prior to his admission to Boys Town in the boy's own community under circumstances showing personal interest of the doctor for the boy's welfare, therefore be it

Resolved, That this House of Delegates give its endorsement to this request for cooperation in so worthy a service undertaking, and that all member physicians of this Association be urged to provide whatever help it may be possible for them to give to Boys Town of Missouri, and be it further

Resolved, That these findings be announced in THE JOURNAL of the Missouri State Medical Association.

The resolution was referred to the Reference Committee on Resolutions.

Dr. Thompson gave the report of the Council (page 584).

Roland M. Klemme, M.D., St. Louis, presented a project, which he had placed before the Council, of the adoption by physicians of a prescription blank to be prepared on bank note paper by or for the American Medical Association which would be distributed periodically to all physicians free of charge. Expense of the blanks would be covered by advertising of approved pharmaceuticals or products on the reverse side of the prescription blank.

Upon motion, this was referred to the Reference Committee on Resolutions.

Otto T. Blanke, M.D., Joplin, presented the following resolution:

WHEREAS, The duties and responsibilities of the Medical Education, Public Welfare and Hospitals, Advisory Committee to the Medical-Health Civil Defense Program, and the Public Education Committees must, of need, increase, to meet the constant demand and requests from governmental units and allied medical organizations for assistance and closer cooperation; and to competently fulfill these obligations it is necessary to increase the work of these Committees; and in order to efficiently complete the work, additional facilities and personnel are required in a location where convenient access is available, therefore be it

Resolved, That the House of Delegates of the Missouri State Medical Association, in Annual Session assembled, instruct the Council of the Missouri State Medical Association to proceed within the year to establish such an office in the City of Jefferson City, Missouri, and be it further

Resolved, That this office shall be for the purposes of the activities and programs of the public Education Committee and Medical Education, Public Welfare and Hospital Committee, and be it further

Resolved, That the personnel, duties and objectives of said facilities shall be planned, proposed and outlined by these Committees, who shall present their plan for the consideration and approval of the Council, and be it further

Resolved, That the duties of the personnel employed in said office shall be outlined by the Committees by and with the consent of the Council, and be it further

Resolved, That said Committees shall present to the Council, within sixty days their recommendations of the program, proposed budget and general outline of the activities of said office for the consideration and action of the Council, and be it further

Resolved, That the approved program be activated within six months after the adoption of this resolution.

This resolution was referred to the Reference Committee on Resolutions.

Upon motion, duly seconded, the House of Delegates adjourned.

WEDNESDAY, APRIL 25, 1951

Final Session

The House of Delegates convened at 2:00 p.m., April 25, with the Speaker, F. T. H'Doubler, M.D., Springfield, presiding.

FRANCIS D. DEAN, M.D., Fayette: Mr. Speaker, the Committee on Credentials reports 115 Delegates, ten Councilors and four Officers registered.

H. E. Petersen, M.D., St. Joseph, Secretary, read the roll of delegates and alternates, which showed a quorum present.

Upon motion, duly seconded, the minutes of the previous meeting were approved as read by H. E. Petersen, M.D., St. Joseph, Secretary.

NOMINATION FOR PRESIDENT-ELECT

R. Emmett Kane, M.D., St. Louis, asked for the floor for R. E. Schlueter, M.D., St. Louis, who nominated

J. W. Thompson, M.D., St. Louis, for President-Elect.

Upon motion the Secretary was instructed to cast the unanimous ballot of the House of Delegates for J. W. Thompson, M.D., St. Louis, for President-Elect. The Secretary cast the unanimous ballot of the House of Delegates for Dr. Thompson for President-Elect and the Speaker declared Dr. Thompson so elected.

W. L. Allee, M.D., Eldon, and R. E. Schlueter, M.D., St. Louis, conducted Dr. Thompson to the platform.

J. W. Thompson, M. D., St. Louis: Mr. Speaker and members of the House of Delegates: There are times in each of our lives when we must spontaneously and extemporaneously speak from the heart. This is such a case. As Dr. Schlueter told you, I have tried to serve to the best of my ability those whom have served and preceded me. In the years that I have been in the House of Delegates, I have known outstanding patriarchs such as Dr. Schlueter, Dr. Kane, Dr. Hamilton and innumerable others who have given something more than they are obligated to throughout their entire lives. That, Gentlemen, is what makes our profession a great one and I assure you that I am proud of the honor you have conferred upon me. I pray that I may humbly serve my profession through all the days of my life until I can feel that I have been of the same quality of service to all of you. Thank you.

Paul Baldwin, M.D., Kennett, gave the report of the Committee on Nominations.

Report of the Committee on Nominations

For Vice Presidents: Otto W. Koch, M.D., Clayton; A. P. Rowlette, M.D., Moberly; Rollin H. Smith, M.D., West Plains.

For Delegates to the American Medical Association: R. E. Schlueter, M.D., St. Louis, delegate, F. G. Pernoud, M.D., St. Louis, alternate; James R. McVay, M.D., Kansas City, delegate, R. B. Wray, M.D., Nevada, alternate.

For Speaker of the House of Delegates: F. T. H'Doubler, M.D., Springfield; Vice Speaker, Victor E. Scherman, M.D., St. Louis.

On motion, duly seconded, these officers were declared elected.

The Secretary reported the results of the election of Councilors as follows:

2nd District—W. F. Francka, M.D., Hannibal.

4th District—John O'Connell, M.D., Overland.

6th District—R. W. Kennedy, M.D., Marshall.

8th District—W. S. Sewell, M.D., Springfield.

10th District—Frank W. Hall, M.D., Cape Girardeau.

C. Edgar Virden, M.D., Kansas City, was installed as President of the Association.

The following appointments to committees to fill expired terms were announced by Dr. Virden:

Scientific and Postgraduate Work: D. L. Sexton, St. Louis, Chairman; Kenneth Glover, Mount Vernon, and R. R. Coffey, Kansas City. Associate members: Joseph L. Fisher, St. Joseph; Paul O. Hagemann, St. Louis; Carl R. Ferris, Kansas City; Walter Tillman, Springfield; F. R. Crouch, Farmington; John O'Connell, Overland.

Publication: R. O. Muether, St. Louis, Chairman; V. T. Williams, Kansas City; H. E. Petersen, St. Joseph; M. D. Overholser, Columbia; Paul O. Hagemann, St. Louis.

Defense: Charles E. Hyndman, St. Louis, Chairman.

Medical Education and Hospitals: John S. Knight, Kansas City, Chairman.

Cancer: E. C. Ernst, St. Louis, Chairman; E. Kip Robinson, Kansas City; Everett Sugarbaker, Jefferson City; Associate Members: Claude J. Hunt, Kansas City; George O. Miles, Kansas City; Eugene Bricker, St. Louis.

Medical Economics: A. P. Rowlette, Moberly, Chairman; C. T. Herbert, Cape Girardeau; Arthur Smith, Kansas City; Associate Member: Oscar P. Hampton, University City.

Mental Health: Frank M. Grogan, St. Louis, Chairman; E. F. Hoctor, Farmington.

Maternal Welfare: K. E. Cox, Kansas City, Chairman; J. L. Johnston, Springfield.

Infant Care: G. V. Herrman, Kansas City, Chairman; Daniel B. Landau, Hannibal; Associate Members: J. S. Sennott, Jefferson City; Helen Yeager, Columbia.

Health and Public Instruction: A. W. McAlester, III, Kansas City, Chairman; R. B. Wray, Nevada; George Kelling, Waverly.

Constitution and By-Laws: Durward G. Hall, Springfield, Chairman; Paul Baldwin, Kennett; Hubert Parker, Kansas City.

Fractures: Daniel L. Yancey, Springfield, Chairman; W. J. Stewart, Columbia; N. S. Pickard, Kansas City; Associate Members: Jacob Kulowski, St. Joseph; B. L. Murphy, Hannibal.

Conservation of Eyesight: C. Souter Smith, Springfield, Chairman; W. L. Post, Joplin.

Control of Venereal Disease: A. W. Neilson, St. Louis, Chairman; J. G. Siceluff, Springfield.

Industrial Health: R. A. Sutter, St. Louis, Chairman; H. M. Roebber, Bonne Terre; V. T. Williams, Kansas City.

Diabetes: W. H. Olmsted, St. Louis, Chairman; Llewellyn Sale, St. Louis; E. D. Baskett, Columbia.

Anesthesiology: C. R. McCubbin, Kansas City, Chairman; Carl Ness, St. Joseph.

Physical Medicine: C. Stewart Gillmor, Kansas City, Chairman.

Tuberculosis: Paul Murphy, St. Louis, Chairman; I. J. Flance, St. Louis; E. E. Glenn, Springfield; Lawrence E. Wood, Kansas City; J. L. Mudd, St. Louis; C. A. Brashear, Mount Vernon; W. P. McDonald, St. Joseph; F. E. MacInnis, Kansas City; H. L. Greene, Hannibal.

Study of Cardiac Diseases: Glenn Hendren, Liberty, Chairman; Drew Luten, St. Louis; A. M. Estes, Cape Girardeau; H. W. Carle, St. Joseph.

Rural Medical Service: A. E. Spelman, Smithville, Chairman; R. W. Kennedy, Marshall; W. A. Broyles, Bethany; W. J. Shaw, Fayette; R. B. Wray, Nevada; Martin M. Hart, Salem; A. S. Bristow, Princeton; M. B. Casebolt, Kansas City.

Upon motion, duly seconded, these appointments were approved.

Speaker: The next order of business is installation of officers, councilors and committee members. Will all newly elected officers, councilors and committee members come forward and remain standing?

C. Edgar Virden, M.D., Kansas City: Gentlemen, will you raise your right hand and I will ask Dr. Thompson to place his hand on this Holy Bible and repeat after me?

"I solemnly swear that I shall carry out the duties of the office I am assuming to the best of my ability. I shall strive constantly to maintain the ethics of the medical profession and to promote the public health and welfare. I shall dedicate myself and my office to improving the health standards of the people of Missouri and to the task of bringing increasingly improved medical care within the reach of every citizen. I shall uphold the Constitution of the United States and the Constitution and By-laws of the Missouri State Medical Association at all times. I shall champion the cause of freedom in medical practice—and freedom for all my fellow men.

"I do solemnly swear that I will discharge the duties of this office to the best of my ability, so help me God."

Upon motion of R. Emmett Kane, M.D., St. Louis, it was voted that the final session of the House of Dele-

predictable control of hay fever

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SCHERING

gates meet at 1:30 p.m. on the last day of each Annual Session.

Durwood G. Hall, M.D., Springfield: One of our Delegates to the American Medical Association, Dr. James R. McVay, Kansas City, has handed me a copy of a telegram from the Secretary and General Manager of the American Medical Association and the Secretary of the American Hospital Association to the editor and chairman of the board of the *Woman's Home Companion* magazine and the Crowell-Collier Publishing Company, respectively.

I move in compliance with Section 1, Chapter III, page 7, of this Association's by-laws that for the information and action of those concerned that I be allowed to bring this new business to the floor of the House in its final session.

Permission was granted.

Dr. Hall reported as follows: The copy of the telegram is as follows: "For your information. The following telegram to the *Woman's Home Companion* was sent jointly by the American Hospital Association and the American Medical Association to protest 'Trouble in Our Hospitals'—an article by Albert Deutsch in the current issue of the magazine.

"William A. H. Birnie, Editor,
"Woman's Home Companion,
"640 Fifth Avenue,
"New York 19, New York

"Thomas H. Beck,
"Chairman of the Board,
"Crowell-Collier Pub. Co.,
"640 Fifth Avenue,
"New York 19, New York

"APHF3 DL Chicago, Illinois, April 23, 1951.
"We wish to protest strongly the tone of 'Trouble in Our Hospitals' by Albert Deutsch in the current issue of *Woman's Home Companion*. While it is true there are some areas of disagreement between physicians and hospitals—just as there are in all human relationships—the author of this article has magnified these differences of opinion out of all proportion to the truth. His statement that 'The American Medical Association and the Hospitals, which should be marching hand in hand toward better services for the sick, are locked in combat,' is nothing short of sensationalism. The doctors and hospitals have always cooperated in efforts to deliver the best possible medical care and will continue to do so. Any differences are being ironed out peaceably around the conference table.

"George Bugbee, Secretary,
"American Hospital Association.

"George T. Lull,
"Secretary and General Manager,
"American Medical Association."

Mr. Speaker, your Reference Committee recommends that our Executive Secretary be instructed to frame a similar telegram of protest to the Editor and Chairman of *Woman's Home Companion* magazine and the Crowell-Collier Publishing Company, respectively, both of New York City, and that in addition that the action of this Association be firmly publicized through news agencies and pursued to the best obtainable end by the Executive Office and the Council in an appropriate manner. I move the adoption of this resolution.

Upon second, the motion carried.

Dr. Hall: The Committee on Maternal Welfare made its report in the 93rd Annual Session's Reports of Officers and Committees, on April 23, 1951, and this body unanimously approved its findings. Subsequently, it has been brought to the attention of your Reference Committee that there is possibly some misunderstanding on the part of other state or national agencies interested in this program as to the exact feeling of our Association concerning the EMIC program. Therefore, a resolution clarifying our Association's stand in this matter has been presented to your Reference Committee on Resolutions.

I move that in compliance with Section 1, Chapter III, page 7, of the By-laws as revised by our Association, that inasmuch as this resolution has been digested by your Reference Committee, and a clarification of the stand of the Association is in order, the House give unanimous consent to the introduction of this new bill and, that further, inasmuch as it is reported out by your Reference Committee on Resolutions, after due deliberation, it be finally acted upon at this meeting.

Unanimous consent was given.

Dr. Hall presented the following resolution on the EMIC.

Whereas, The growing mobilization is causing some consideration of the possibility that a program of federal supported maternal and child care may need to be again instituted to alleviate hardship among dependents of service men, and

Whereas, Studies at both national and state levels have disclosed that the present time no substantial hardship exists that would justify the initiation of such a program, and

Whereas, A possibility of misinterpreting the desires and sentiments of this State Medical Association wherein it has signified its intention to cooperate with such a program if it should eventually be needed, and such a misinterpretation might result in the conclusion that our Association advocate such a program at this time, now therefore be it

Resolved, That this House of Delegates does not favor the reactivation of any EMIC or related program at this time and records its position as not promoting, supporting or seeking such legislation, and be it further

Resolved, That should circumstances change substantially and there be proved a real hardship for the families of service men, the medical profession of Missouri is prepared to review its decision and to adapt its position in a way that will serve a demonstrated public need with due regard to the interests of the profession and the public.

Upon motion, duly seconded, this resolution was adopted.

Dr. Hall then presented the report of the Reference Committee on Resolutions.

REPORT OF THE REFERENCE COMMITTEE ON RESOLUTIONS

At the recessed session on April 23, 1951, a draft of a resolution read before the House was referred to the Reference Committee on Resolutions as follows:

Whereas, Boys Town of Missouri has undertaken a program for rehabilitation of delinquent or near delinquent boys of the state, and

Whereas, This program is an important contribution to the solving of a problem of great importance to all Missourians, and

Whereas, The Missouri State Medical Association has been invited to cooperate in the program by encouraging member physicians to provide a medical check or physical examination for each boy prior to his admission to Boys Town in the boy's own community under circumstances showing personal interest of the doctor for the boy's welfare, therefore be it

Resolved, That this House of Delegates give its endorsement to this request for cooperation in so worthy a service undertaking, and that all member physicians of this Association be urged to provide whatever help it may be possible for them to give to Boys Town of Missouri. And be it further

Resolved, That these findings be announced in The Journal of the Missouri State Medical Association.

Mr. Speaker, I move the adoption of the resolution as read.

Upon second, the resolution was adopted.

Dr. Hall continued the report of the Reference Committee on Resolutions as follows: At the reeessed session on April 23, 1951, the House approved in principle the presentation made by Dr. Roland Klemme, St. Louis, pertaining to universal adoption by physicians of a prescription blank to be prepared on bank note paper by or for the American Medical Association without expense to national, state or local physi-

cians or their organizations. The Reference Committee on Resolutions was instructed to bring back to the floor of the House of Delegates of this Association an approved resolution or instrument for final action.

After obtaining additional information concerning this project and discussing it both pro and con, it is the recommendation of your Reference Committee that:

a. Dr. Klemme be advised that the House of Delegates in session has approved his idea in principle, but subject to further investigation, approval of the American Medical Association and, possibly, various tests before final adoption of this plan.

b. That the Delegates of the Missouri State Medical Association to the American Medical Association be encouraged to assist Dr. Klemme in presenting this idea to the Board of Trustees of the American Medical Association at such time and place as they deem most advisable, in order to determine the eventual true value and application of this project.

We move the adoption of these recommendations.

Upon second, the recommendation was adopted.

Dr. Hall continued the report of the Reference Committee on Resolutions as follows: At the recessed session of the House of Delegates on April 23, 1951, a resolution was submitted by Dr. Otto Blanke, of Jasper County, and referred to the Reference Committee on Resolutions pertinent to providing in Jefferson City, Missouri, an office for certain functions of this Association.

After careful deliberation and again hearing the pros and cons of this recurring question, which the House of Delegates and its committees have studied in detail for the last several years, including extensive findings reported by the Reference Committee on Resolutions in 1949 and again in 1950, we are prepared to give you our considered opinion and recommendations.

These recommendations are predicated upon the feeling of your Reference Committee that the importance of this problem and its many aspects is the responsibility of the Association and its members as a whole, requiring definite action and a report directly to this body which should be worked out after much longer deliberation than can be arranged at any one meeting of your Reference Committee, House of Delegates or Council meetings. Now it is the intent of the Reference Committee to urge the House to establish a committee on this problem which will be active and considerate in its deliberations and positive in its findings. It is therefore recommended that:

a. No action be taken by the House of Delegates on this resolution as submitted.

b. That a representative committee be appointed by the incoming Speaker of the House, who is to be elected this date, consisting of no fewer than three or more than seven informed representative medical Association members of the state. This committee is to be instructed to study and consider the resolution presented, plus others submitted in past sessions, along with the actions of the House of Delegates and its Council. This study is to include all the implications, originating ideas, pros and cons of said recommendations and lead to a recommendation within the next six months. This committee will report to the Council of this Association before its annual budgetary meeting so that, if action is deemed advisable and approved by the Council, provision for same can be included among the budgetary considerations. This consideration and others of the committee and Council are to be recorded and reported in the regular minutes of the Council and published in THE JOURNAL of the Association, and also the "Reports of Officers and Committees" of the Association prior to the 94th Annual Session of this Association, in order that additional consideration or possible final action may be taken by this House of Delegates in its regular session.

Mr. Speaker, I move the adoption of these recommendations.

Upon second, the recommendations were adopted.

F. T. H'Doubler, M.D., Springfield, Speaker of the House, announced the following committee for this study: J. W. Shaw, Fayette, Chairman; Kenneth E. Cox, Kansas City; Daniel L. Yancey, Springfield; W. O. Finney, Chaffee; Donald M. Dowell, Chillicothe; Everett D. Sugarbaker, Jefferson City; Llewellyn Sale, St. Louis.

A. Denton Vail, M.D., Springfield, gave the report of the Reference Committee on Amendments to Constitution and By-Laws.

REPORT OF THE REFERENCE COMMITTEE ON AMENDMENTS TO THE CONSTITUTION AND BY-LAWS

At the recessed session of the House of Delegates of this Association held April 23, 1951, the Reference Committee on Constitution and By-Laws reviewed the report of the standing Committee on Constitution and By-Laws as published in the "Reports of Officers and Committees" of the Missouri State Medical Association, the 93rd Annual Session, Kansas City, 1951, pages 32 to 37 inclusive, and reported to this House of Delegates the following recommendations:

1. That the House of Delegates authorize the Council to apply for the amended charter as submitted by the standing Committee.

2. That the draft of the proposed Constitution be accepted by the House of Delegates for publication in THE JOURNAL as required by by-law, and for submission for action at the next meeting of this Association in 1952.

3. That the proposed amendments to the By-Laws, having been published as required, be adopted at this session of the House of Delegates.

The House of Delegates approved these recommendations and, at this time, these proposed changes in the By-Laws, having laid on the table for one day, are now submitted for your final action.

I move that the House of Delegates approve these changes in the By-Laws.

Upon second, the amendments proposed by the Committee on Constitution and By-Laws were adopted.

Dr. Vail continued the report of the Reference Committee on Amendments to the Constitution and By-Laws as follows: At the recessed session of the House of Delegates of this Association held April 23, 1951, the Reference Committee on Constitution and By-Laws reviewed the report of the Chairman of the Council and reported to this House of Delegates with recommendation for the following change in the By-Laws:

Amend Chapter VII, Section 1, by adding after "A Committee on Scientific and Postgraduate Work" a new committee to be called "A Committee on Hospital and Professional Relations." No additional changes in this section are recommended.

The House of Delegates approved this recommendation. This proposed change in the By-Laws, now having laid on the table for one day, is submitted for your final action.

I move that the House of Delegates adopt this amendment.

Upon second, the amendment was adopted.

Dr. Vail continued the report of the Reference Committee on Amendments to the Constitution and By-Laws as follows: At the recessed session of the House of Delegates of this Association held April 23, 1951, the Reference Committee on Constitution and By-Laws, upon reviewing the report of the Committee on Public Policy and Public Relations, as published, recommended the following change in the By-Laws:

Amend Chapter VII, Section 3, by eliminating the first sentence which reads "The Committee on Public Policy and Public Relations shall consist of three members; and the President and President-Elect and such other members whose experience suggests their value in emergency, to be called by the Chairman of the Committee," and substitute therefor this sentence:

The Committee on Public Policy and Public Relations shall consist of the President and President-Elect of the Association, one elected member of the Council and two members appointed by the President of the Association."

The House of Delegates approved this recommendation which, after having laid on the table for one day, is now submitted for your final action.

I move that the House of Delegates approve this amendment.

Upon second, this amendment was adopted.

R. Lee Hoffmann, M.D., Kansas City, presented the report of the Reference Committee on Report of Officers.

REPORT OF THE REFERENCE COMMITTEE ON REPORTS OF OFFICERS

The Committee recommends acceptance for action by the House of Delegates the following, as submitted in the report of the Council on April 22.

1. Request from the Missouri Heart Association and the St. Louis Heart Association for joint sponsorship of a conference on "Cardiovascular Disease" with the Missouri Academy of General Practice and the Missouri Division of Health.
2. Request from the American Medical Association Educational Foundation for support.
3. Continued approval and support of the activities of the Community Health League of Missouri.
4. Approval of the Civilian Defense Plan as to medical participation in Missouri.
5. Approval of the plan "You and Your American Medical Association" has been referred to the Committee on Scientific and Postgraduate Work.

The Committee moves acceptance of these recommendations.

Upon second, the recommendations were approved.

E. R. Bohrer, M.D., Jefferson City, gave the report of the Reference Committee on Scientific Exhibits.

REPORT OF THE REFERENCE COMMITTEE ON SCIENTIFIC EXHIBITS

Winners of the awards of the Association for excellence in presentation of Scientific Exhibits are as follows:

First, Booth J-K, "Common Rheumatic Diseases," C. Stewart Gillmor, M.D., Kansas City.

Second, Booth A, "Practical Points in Diagnosis and Treatment of Children's Diseases," Harry M. Gilkey, M.D., Kansas City.

Third, Booth E, "Rectal Diseases," Fred B. Campbell, M.D., Kansas City.

Upon motion, duly seconded, the House of Delegates adjourned *sine die*.

THE COUNCIL

HOTEL PRESIDENT, KANSAS CITY

April 23, 1951

The Council met at noon on April 23, 1951, during the Annual Session of the Association with J. W. Thompson, M.D., St. Louis, Chairman, presiding.

A request from the American Heart Association transmitted through the Missouri and St. Louis Heart associations to sponsor jointly with the Missouri Academy of General Practice and the Missouri Division of Health a conference on "Cardiovascular Diseases" was approved.

The Civilian Defense Plan as presented at the Sunday evening program by Dr. Curtis H. Lohr, St. Louis, was approved and the Council recommended that it become the medical part of the state civilian defense program.

James R. McVay, M.D., Kansas City, presented a plan of the Council on Medical Service of the American Medical Association on "You and Your A.M.A." which is planned to acquaint physicians with the A.M.A. and its work. This was approved for referral to the Committee on Scientific and Postgraduate Work.

Roland M. Klemme, M.D., St. Louis, presented a plan of A.M.A. participation in furnishing prescription blanks to all physicians, these to be paid for by advertising of approved articles. It was decided that the House of Delegates should be asked to hear Dr. Klemme's presentation.

A resolution approving Boys Town of Missouri and asking cooperation of physicians was adopted.

Approval and commendation was voted for the work of the Advisory Committee to the Selective Service System.

Meeting of April 25, 1951

The Council convened immediately following the adjournment of the House of Delegates on April 25, 1951, at the Municipal Auditorium, Kansas City, C. Edgar Virden, M.D., Kansas City, President, presiding. Victor B. Buhler, M.D., Kansas City, was elected Chairman of the Council, and W. S. Sewell, M.D., Springfield, Vice Chairman.

Armand D. Fries, M.D., St. Louis, was elected Councilor of the Third Councilor District to fill the vacancy created by the resignation of J. W. Thompson, M.D., St. Louis, President-Elect.

The following officers were elected: Secretary, H. E. Petersen, M.D., St. Joseph; Treasurer, C. E. Hyndman, M.D., St. Louis; Editor, R. O. Muether, M.D., St. Louis; Associate Editor, Vincent T. Williams, M.D., Kansas City.

On motion of Donald M. Dowell, M.D., Chillicothe, the hyphenation of Linn County with the Caldwell-Livingston County Medical Society was approved.

Upon motion of R. W. Kennedy, M.D., Marshall, the hyphenation of Ray County with the Lafayette County Medical Society was approved.

REGISTRATION AT NINETY-THIRD ANNUAL SESSION

First Councilor District—66

Andrews, B. W., St. Joseph
Baird, J. E., Excelsior Springs
Bauman, H. C., Maryville
Biggins, Cloice, Lathrop
Bloomer, G. T., St. Joseph
Bristow, A. S., Princeton
Bristow, G. B., Kansas City
Bristow, R. B., Kansas City
Broyles, Watkins A., Bethany
Buck, Ronald M., St. Joseph
Calvert, Lewis C., Weston
Carle, H. W., St. Joseph
Chastain, M. W., Smithville
Conrad, Joseph, Chillicothe
Craig, O. W. D., St. Joseph
Cullers, C. H., Trenton
Daley, Frank, Hamilton
Dawson, Lerton V., Excelsior Springs
Dowell, Donald M., Chillicothe
Duffy, O. F., Trenton
DuMont, C. C., St. Joseph
Edwards, Theodore F., N. Kansas City
Fischer, Joseph L., St. Joseph
Forgrave, L. Paul, St. Joseph
Fuson, Wm. A., Trenton
Gearhart, M., Bethany
Goldberg, I. E., Braymer
Grant, C. S., St. Joseph
Grimes, M. E., St. Joseph
Groce, N. W., Chillicothe
Hendren, G. W., Liberty
Howden, T. L., St. Joseph
Ide, Lucien W., St. Joseph
Imes, E. D., Maryville
Johnson, Glenn D., Maysville
Johnson, M. C., Richmond
Kimes, I. D., Cameron
Knox, Earl, N. Kansas City
Kulowski, Jacob, St. Joseph
Lee, L. R., Bethany
Longfield, Fred J., Lathrop
McCool, Robert, Chillicothe
McCracken, S. R., Excelsior Springs

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Novota, Otto, Smithville
Parker, J. Z., Pattonsburg
Perry, J. M., Princeton
Petersen, H. E., St. Joseph
Pickett, C. P., Princeton
Platz, John H., Carrollton
Quisito, J. M., Trenton
Redmond, Wm., St. Joseph
Rosenthal, I. I., St. Joseph
Rost, Wm. B., St. Joseph
Schroeder, S. O., Liberty
Shevlin, Charles F., St. Joseph
Snead, Wm. H., St. Joseph
Spencer, Floyd H., St. Joseph
Vandiver, V. D., Chillicothe
Whitsell, O. Earl, St. Joseph
Wilson, F. K., Winston
Wilson, Virgil R., Rosendale

Second Councilor District—29

Bohnsack, R. W., Brookfield
Bridges, J. R., Kahoka
Buck, U. G., Rothville
Cohrs, Clarence C., Moberly
Davis, Landis Y., Canton
Dixon, John R., Brookfield
Donley, Robert R., Monett
Dreyer, Phillip V., Huntsville
Eggleston, D. E., Macon
Fleming, Thos. S., Moberly
Francka, W. F., Hannibal
Gashwiler, J. S., Novinger
Goodrich, Howard, Hannibal
Greene, H. L., Hannibal
Hardesty, J. W., Hannibal
Hooker, John, Clarksville
Huber, L. E., Moberly
Jennings, P. W., Canton
Landau, D. B., Hannibal
Lanning, Robert J., Hannibal
Miltenberger, Val E., Kirksville
Montgomery, J. S., Milan
Murphy, B. L., Hannibal
Petty, W. S., Macon
Rice, G. C., Brunswick
Roller, Merrill J., Hannibal
Smith, R. D., Marceline
Smith, W. J., Hannibal
Stuart, D. D., Brunswick

Third Councilor District—72

Allen, Henry, St. Louis
Allen, Hollis, St. Louis
Barrett, R. M. S., St. Louis
Bartlett, Willard Jr., St. Louis
Bieri, Earl, St. Louis
Burford, Cyrus E., St. Louis
Burst, Emil A., St. Louis
Calkins, Delevan, St. Louis
Campbell, Cecil S., St. Louis
Carroll, George A., St. Louis
Danis, Peter G., St. Louis
Dorsett, E. Lee, St. Louis
Doyle, Charles R., St. Louis
Echterhoff, Harry R., St. Louis
Edwards, Joseph C., St. Louis
Ellis, Sam T., St. Louis
Ernest, Edwin C., St. Louis
Eversoll, Norton J., St. Louis
Fineberg, Maxwell, St. Louis
Fries, Armand D., St. Louis
Grindon, Joseph Jr., St. Louis
Hanlon, C. R., St. Louis
Hanser, S. Albert, St. Louis
Hartnett, Leo J., St. Louis
Hollo, Vencel W., St. Louis
Hutton, Joseph L., St. Louis
Janney, Jas. G. Jr., St. Louis
Jaudon, Joseph C., St. Louis
Jones, Otev S., St. Louis
Jost, Charles A., St. Louis
Kane, R. Emmet, St. Louis
Kelly, Charles A., St. Louis
Kettelkamp, G. D., St. Louis
Klemme, R. M., St. Louis
Knese, Luke A., St. Louis
Kohler, Louis H., St. Louis
Koon, Bernard T., St. Louis
Lohr, Curtis, St. Louis
Luedde, Philip S., St. Louis
Luten, Drew, St. Louis
McElvain, Robert C., St. Louis
Mackey, John F., St. Louis
Martin, Charles E., St. Louis
Merz, Jean J., St. Louis
Morris, Mary E., St. Louis
Mueller, Robert, St. Louis
Muether, Raymond O., St. Louis
Neilson, Arthur W., St. Louis
Norton, William H., St. Louis
O'Dowd, James A., St. Louis
Peden, Joseph C., St. Louis
Reinhard, E. H., St. Louis
Rudi, Herbert J., St. Louis
Sale, Llewellyn, St. Louis
Sante, L. R., St. Louis
Scherman, Victor E., St. Louis
Schlueter, Robert, St. Louis
Schnoebelen, P. C., St. Louis
Shrader, E. Lee, St. Louis
Simon, Jerome I., St. Louis
Smolik, Edmund A., St. Louis
Thoma, G. E., St. Louis
Thompson, J. W., St. Louis
Tjofiat, Oliver E., St. Louis
Vohs, Carl F., St. Louis
Wachter, Harry, St. Louis
Webb, Lewis M., St. Louis
Werner, William A., St. Louis
Weyerich, Leon F., St. Louis
Woolsey, R. D., St. Louis
Zahorsky, Theo. S., St. Louis
Zeinert, O. B., St. Louis

Fourth Councilor District—34

Bailey, W. H., St. Louis
Brown, Eugene R., St. Louis
Compton, J. R., St. Louis
Creech, J. C., Troy
Donnell, R. H., Crystal City
Dowd, James F., St. Louis
Dyer, C. P., St. Louis
Finley, F. L., St. Louis
Forsman, W. W. Jr., St. Louis
Gaines, Q. M., St. Louis
Hampton, O. P. Jr., St. Louis
Jensen, Julius, St. Louis
Keller, R. M., St. Louis
Kendis, J. B., St. Louis
Kister, George E., St. Charles
Koch, Otto, Clayton
McMurray, H. C., St. Charles
Mayfield, J. L., Washington
Mays, Frank G., Washington
Meador, James R., Clayton
Muench, L. O., Washington
O'Connell, John, Overland
Pearl, J. F., St. Clair
Rutledge, John F., Crystal City
Selle, Harold C., St. Louis
Steiner, A. J., St. Louis
Sterling, J. A., Maplewood
Vitale, N. S., St. Louis
Walther, Roy A. Sr., St. Louis Co.
Walton, J. H., St. Louis
Weber, W. K., St. Louis
Whitener, P. R., St. Louis
Wyatt, Lois, Kirkwood
Yoskit, Harry, Festus

Fifth Councilor District—47

Aldridge, M. R., Jefferson City
Allee, James, Columbia
Allee, W. L., Eldon
Atkins, James, Columbia
Baskett, E. D., Columbia
Belden, E. A., Jefferson City
Bloom, W. A., Fayette
Bohrer, E. R., Jefferson City
Bruner, Claude R., Columbia
Burke, J. P., Jr., California
Caldwell, James C., Fulton
Carlton, C. E., Stoutland
Chalkley, J. I., Columbia
Crews, Robert N., Fulton
Dean, F. D., Fayette
Dietrich, Carl, Columbia
Dwyer, T. L., Mexico
Etheridge, Maude, Columbia
Gardner, J. W., Glasgow
Garner, L. M., Jefferson City
Jolley, J. F., Mexico
Kauffman, Ruth, Versailles
Kibbe, Edgar A., California
Ladenson, Roland, Columbia
Lamb, Sam E., Glasgow
Lamke, Charles M., Columbia
McComas, A. R., Sturgeon
Meinershagen, C. W., Jefferson City
Modlin, John, Columbia
Neal, M. Pinson, Columbia
Nifong, Frank G., Columbia
Overholser, M. D., Columbia
Sandy, Charles, Pilot Grove
Shaw, Wm. J. Jr., Fayette
Shaw, Wm. J. Sr., Fayette
Shull, G. D., Jefferson City
Smith, S. D., Columbia
Stauffer, H. B., Jefferson City
Stewart, Wm., Columbia
Stuart, B. M., Boonville
Stubbs, Trawick H., Columbia
Summers, J. S., Jefferson City
Thomas, Horace, Columbia
Washburn, J. L., Versailles
Watkins, G. L., Columbia
Wilcox, H. L., Boonville
Windmiller, Myrl, Columbia

Sixth Councilor District—44

Aiken, George A., Marshall
Aiken, Richard F., Marshall
Allen, Claude J., Rich Hill
Allen, Wm. H., Nevada
Barger, O. B., Harrisonville
Brady, H. S., Concordia
Campbell, A. J., Sedalia
Cooper, John M., Butler
Davis, C. B., Nevada
Dyer, D. P., Sedalia
Ellis, Colburn H., Garden City
Glenn, David H., Warsaw
Hansen, Arthur L., Butler
Hartwell, B. O., Drexel
Haynes, Robert C., Marshall
Hill, John J., Eldorado Springs
Hughes, S. B., Clinton
Jennings, R. J., Windsor
Johnson, Charles S., Warrensburg
Jones, E. S., Harrisonville
Jordan, Ray B., Windsor
Kennedy, R. W., Marshall
Koppenbrink, W. E. Jr., Higginsville
Lawless, Chas. L., Marshall
Lissack, Edmund, Concordia
Lockwood, W. E., Slater
Long, D. S., Harrisonville
Lusk, C. A., Jr., Butler
Luter, Carter, Butler
Madison, Waite H., Marshall
Martin, W., Odessa
Maxson, T. R., Warrensburg
Robinson, Edw. E., Adrian
Schooley, R. C., Odessa
Siegel, Carl D., Sedalia
Sipes, Frank M., Corpus Christi, Texas
Stauffacher, C. G., Sedalia
Todd, Thomas B., Nevada
Tracy, H. A., Belton
Trader, C. B., Sedalia
Triplett, Jacob S., Harrisonville
Walker, G. S., Clinton
Wilcox, Winton W., Warrensburg
Wray, Rolla B., Nevada

Seventh Councilor District—281

Ahlefeld, Chas. B., Kansas City
Aisenstadt, E. A., Kansas City
Allebach, Hobart K., Kansas City
Allen, Chas. E., Kansas City
Altomare, Edw. P., Kansas City
Arms, Arnold V., Kansas City
Aschman, Theo. H., Kansas City
Asher, Arthur G., Kansas City
Atcheson, Bellfield, Kansas City
Atwell, Floyd C., Kansas City
Baer, A. J., Kansas City
Ball, James E., Kansas City
Ballard, V. B., Kansas City
Barelli, Pat A., Kansas City
Barnett, Gordon P., Kansas City
Barry, Mercedes, Kansas City
Becker, R. R., Kansas City
Beil, J. Wallace, Kansas City
Bennett, Jos. S., Independence
Bergmann, Victor H., Kansas City
Bernreiter, Michael, Kansas City
Berry, Maxwell G., Kansas City
Bills, Marvin L., Kansas City
Blumenschein, John C., Independence
Bohan, Peter T., Kansas City
Boughnou, Harvey, Kansas City
Boutros, Amin, Kansas City
Brams, Jack B., Kansas City
Brown, Robert S., Kansas City
Brumm, Lawrence W., Kansas City
Bruner, Robert E., Kansas City
Buckingham, Wm. W., Kansas City
Budke, Harold A., Kansas City
Bunting, Williston P., Kansas City
Burke, T. S., Kansas City
Burns, B. I., Kansas City
Caldwell, John K., Kansas City
Campbell, Frederick B., Kansas City
Capell, C. S., Kansas City
Carbaugh, Glenn C., Kansas City
Carlson, H. E., Kansas City
Carrier, Edson C., Kansas City
Casebolt, M. B., Kansas City
Chapman, Samuel B., Kansas City
Cheeseman, W. B., Kansas City
Cochrane, Jos. J., Kansas City City
Coffey, Ralph R., Kansas
Conover, C. C., Kansas City
Cope, Joseph S., Kansas City
Cortner, Mary C., Kansas City
Counsell, Chester M., Kansas City
Cox, Kenneth E., Kansas City
Cramer, Quentin, Kansas City
Curran, Desmond, Kansas City
Curran, K. E., Kansas City
DeWeese, Everett, Kansas City
Diveley, Rex L., Kansas City
Dixon, V. L., Kansas City
Dodge, Mark, Kansas City
Downey, James W., Kansas City
Duncan, Ralph E., Kansas City
Duncan, Wm. H., Kansas City
Dwyer, H. L., Kansas City

Eldridge, Charles J., Kansas City
Elliott, B. Landis, Kansas City
Elliott, James R., Kansas City
Elliott, Raymond G., Kansas City
Engel, L. P., Kansas City
Enna, Carl, Kansas City
Eubank, Dillard M., Raytown
Eubank, Wm. R., Kansas City
Feist, George V., Kansas City
Ferguson, E. H., Kansas City
Ferris, Carl R., Kansas City
Findley, James W., Kansas City
Fitzgerald, Robert H., Kansas City
Flanders, Horace F., Kansas City
Fowler, James W., Kansas City
Frick, John P., Kansas City
Friedman, Morris L., Kansas City
Ganley, Wm. C., Kansas City
Gestring, Hugh D., Kansas City
Getelson, Jos., Kansas City
Gilkey, Harry M., Kansas City
Gilles, Clifford L., Kansas City
Gillmore, Stewart, Kansas City
Gist, W. L., Kansas City
Gist, Wm. W., Kansas City
Glasscock, E. L., Kansas City
Goldman, Max, Kansas City
Goodman, Leroy, Kansas City
Goodson, Wm. H., Kansas City
Grauerholz, J. W., Kansas City
Greene, W. Wallace, Kansas City
Growdon, John A., Kansas City
Hale, Ralph, Kansas City
Hall, Thomas B., Kansas City
Hamilton, Buford G., Kansas City
Hamilton, Hugh, Kansas City
Hardacre, Ruth A., Kansas City
Haynes, Lee, Kansas City
Haynes, S. E., Kansas City
Herrman, George V., Kansas City
Hess, Paul D., Kansas City
Hibbard, Blaine Z., Kansas City
Hickerson, W. H., Independence
Hill, Jack, Kansas City
Hines, Paul, Kansas City
Hink, Frederick W., Kansas City
Hodgson, Frank, Kansas City
Hoeper, Samuel D., Kansas City
Hoffman, J. S., Kansas City
Hoffmann, R. Lee, Kansas City
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Hunt, Claude J., Kansas City
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Lapp, John G., Kansas City
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McAlester, A. W. III, Kansas City
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McVay, James R. Jr., Kansas City
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Noltensmeyer, Milton H., Kansas City
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Passman, Harold, Kansas City
Pearson, Paul E., Kansas City
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Robinson, G. Wilse, Kansas City
Robinson, G. Wilse Jr., Kansas City
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Schaerrer, Wm. C., Kansas City
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Schorer, Edwin H., Kansas City
Schultz, Loraine E., Kansas City
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Thiessen, E. H., Kansas City
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Trowbridge, E. J. Jr., Kansas City
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Unger, Harold, Kansas City
VanBiber, James, Independence
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Wade, Fred L., Kansas City
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Walker, John W., Kansas City
Wall, Harry C., Kansas City
Watson, Ethel, Independence
Welker, J. E., Kansas City
Wheeler, John H., Kansas City
White, Charles H., Kansas City
White, Edwin C., Kansas City
Wilkinson, E. A., Kansas City
Williams, D. A., Kansas City
Williams, John W., Oak Grove
Williams, Luke E., Kansas City
Williams, Vincent T., Kansas City
Willits, Lyle G., Kansas City
Willoughby, Jean B., Kansas City
Wilson, Clifford C., Kansas City
Wilson, Fernando I., Kansas City
Wilson, Hester J., Kansas City
Withers, O. R., Kansas City
Wood, Lawrence E., Kansas City
Wortmann, R. F., Kansas City
Zellermayer, Jacob, Kansas City
Ziegler, A. M., Kansas City

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Beers, E. G., Seymour
Black, Mervin H., Joplin
Blanke, O. T., Joplin
Brasher, Chas. A., Mt. Vernon
Capetti, Alex F., Aurora
Clinton, Lloyd B., Carthage
Coffelt, Kenneth C., Springfield
DeTar, B. E. Sr., Joplin
Elkins, Ronald F., Springfield
Farrell, Thos. E., Springfield
Farthing, G. W., Springfield
Farthing, R. R., Ozark
Ferguson, John P., Springfield
Fessenden, E. M. Springfield
Glenn, E. E., Springfield
Glover, Kenneth, Mt. Vernon
Granthan, Sam A., Joplin
Griffin, Evelyn, Buffalo
Griffin, Olin A. Jr., Buffalo
Hall, Durward G., Springfield
Hamilton, Eugene H., Joplin
H'Doubler, F. T., Springfield
Hoover, H. Lee, Springfield
James, Edward D., Joplin
Jeans, Virgil, Joplin
Johnson, Wm. F., Springfield
Johnston, Joseph L., Springfield
Kerr, F. T., Monett
Knabb, Kenneth E., Springfield
Knapp, R. K., Golden City
Lockhart, Charles E., Springfield
McCallum, A. J. C., Aurora
McCraw, Doyle, Bolivar
MacDonnell, C. R., Marshfield
Maher, Robert W., Springfield
Maples, F. H., Mt. Vernon
Mickel, Arthur A., Cassville
Musick, J. D., Springfield
Napper, Marvin, Springfield
Newman, Mary J., Cassville
O'Brien, James A., Springfield
Schwartz, Eugene J., Springfield
Sewell, W. S., Springfield
Silsby, Harry D., Springfield
Simpson, E. L., Springfield
Smith, C. Souter, Springfield
Tillman, Walter W. Jr., Springfield
Threadgill, Jesse, Forsyth
Vail, A. Denton, Springfield
Webb, Leslie R., Springfield
Whitten, M. Foster, Carthage

Williams, John W., Springfield
Womack, Fred, Crane
Wood, George H., Carthage
Yancey, Daniel L., Springfield

Ninth Councilor District—19

Bohrer, E. C., West Plains
Breuer, R. E., Rolla
Burns, T. J., Houston
Butts, James D., St. James
Callihan, C. F., West Plains
Carrington, Howard W., Lebanon
Cooper, C. W., Thayer
Davis, H. H., Rolla
Denney, R. W., Mountain Grove
Everist, Guy V., Rolla
Fleming, J. W. Jr., Moberly
Frame, Homer G., Mountain Grove
Harrell, R. E., Lebanon
Hope, James L., Lebanon
Kramer, S. G., Houston
Smith, Rollin H., West Plains
Stricker, E. A., Rolla
Summers, Jacob H., Lebanon
Underwood, M. W., Rolla

Tenth Councilor District—14

Baldwin, Paul, Kennett
Brandon, Walter L., Poplar Bluff
Bull, Ben M., Ironton
Campbell, E. D., Cape Girardeau
English, W. D., Cardwell
Estes, A. M., Cape Girardeau
Ferguson, W. J., Sikeston
Finney, W. O., Chaffee
Hall, Frank, Cape Girardeau
Killion, John J., Portageville
Knotts, H. S., Farmington
Peck, C. R., Kennett
Roebber, H. M., Bonne Terre
Tygett, Glenn J., Cape Girardeau

Guest Speakers—7

Banyai, Andrew L., Milwaukee, Wis.
Beacham, W. D., New Orleans, La.
Bigler, John A., Chicago, Ill.
Burch, G. E., New Orleans, La.
Hanlon, C. Rollin, St. Louis, Mo.
Rosenberg, Edward F., Chicago, Ill.
Schafer, Paul W., Kansas City, Kans.

Guest Physicians—67

Barney, L. F., Kansas City, Kans.
Beachy, W. N., Kansas City
Berker, Dan L., Kansas City
Berry, Paul T., St. Joseph
Birchfield, G. I., Seattle, Wash.
Blim, Don, Kansas City
Blough, Marvin, Kansas City
Borklund, M. K., Kansas City
Brooks, C. M., Carbondale, Ill.
Burger, Paul, Kansas City
Calovich, D. R., Kansas City
Cofer, Vernon L. Jr., Kansas City
Corbett, Elizabeth, Jefferson City
Crowder, R. B., Kansas City
Dawson, Orville, Kansas City
Dillard, Erin, Kansas City
Doering, Robert, Kansas City
Drake, Roy F., Kansas City
Ellison, Alfred, St. Louis
Esearpenter, Geo., Kansas City
Farrington, E. S., Kansas City
Fisher, Finn, Kansas City
Forbes, Burton L., Denver, Colo.
Foster, A. L., St. Joseph
Francisco, C. L., Kansas City, Kans.
Gillmor, C. A., Kansas City
Gose, Don F. Kansas City
Grady, H. J., Kansas City, Kans.
Green, J. D., Kansas City
Griffith, John A. Jr., Kansas City
Hancock, Howard R., Leavenworth, Kans.
Haug, A. D., Wenatchee, Wash.
Haza, B. J., Kansas City
Helwig, Ferdinand C., Kansas City
Hodgson, Corrin H., Rochester, Minn.
Kirk, John S., St. Joseph
Knight, R. Lynn, Kansas City
Lentz, Wm. R., Kansas City
Ley, Engene B., Pueblo, Colo.
Lin, Tung K., Kansas City
McCroskey, Chas., Kansas City, Kans.
McGrede, H. C., Kansas City
Macdonnell, Thos. M., Kansas City
Mitchell, R. E., Springfield
Moruzi, Alexander, Kansas City
Nichols, Sam I., Burnwell, W. Va.
Overesch, Harry B., Kansas City
Pla, Ana, Kansas City
Preston, Paul J., Kansas City
Reinhardt, Robert, Kansas City
Reive, D. L., Kansas City
Ridge, Frank I., Kansas City, Kans.
Rissing, Walter J., Ft. Wayne, Ind.
Rosen, Max, New York, N. Y.
Russell, J., Kansas City
Shelden, Russell, Kansas City
Shook, Lester D., Kansas City
Skillman, Robert K., Kansas City
Steed, Jos., Kansas City
Sweiger, J. H., Maysville
Thomas, Miles E., Denver, Colo.
Tillman, L. M., Kansas City
Walker, L. A., Kansas City
White, Robert, Philadelphia, Pa.
Williams, Jos., Kansas City
Williford, Talmadge, Kansas City
Zettler, Richard L., Hamilton, Ohio

Medical Students—48

Allan, J. R., Columbia
Atwood, Marvin D., Kansas City, Kans.
Bailey, R. J., Columbia
Beckman, D. E., Columbia
Bradshaw, W. D., Warrensburg
Bridwell, Russell, Kansas City
Brukardt, Diane, Columbia
Chasson, O., Columbia
Clay, K. L., Columbia
Drake, Wm. E. Jr., Columbia
Durnell, Monford, Columbia
Ens, Peter D., Kansas City
Gibby, John, Columbia
Gillen, Bill, Kansas City
Gregory, R. W., Columbia
Hagadorn, Jack, Columbia
Hanes, R. L., Columbia
Heev, Max, Columbia
Heilbrunn, Alfred, Columbia
Sister Herman Elizabeth, Kansas City
Hill, H. D., Columbia
Hobbs, Donald D., Kansas City
Hoxworth, G. M., Columbia
Jackson, Albert H., Columbia
Johnson, Geraldine, Kansas City
Kettner, Melvin G., Kansas City, Kans.
Klemme, W. M., Columbia
LaSalle, Michael, Columbia
Lawyer, H. A., Columbia
Leeper, Syd, Columbia
Lehr, David, Columbia
Lyle, Ray M., Kansas City
Maas, James W., Columbia
Mead, Wm., Columbia
Merrims, Ted, Columbia
Montgomery, Austin, Columbia
Moulton, Robert, Columbia
Parman, Robert D., Columbia
Pieper, Geo. C., Columbia
Ransdell, Fred, Columbia
Revare, Paul, Columbia
Ramsey, Robert H., Columbia
Spears, J. L., Columbia
Sportsman, Weldon, Columbia
Teare, Max, Columbia
Thomas, Don, Columbia
Thompson, Lee, Columbia
Viele, Bill, Columbia

Exhibitors—164

Acker, Charles, Kansas City
Allee, H. R., Kansas City
Allen, Paul T., Kansas City
Anderson, R. L., Kansas City
Baldwin, James, Kansas City
Banks, I. L., Kansas City, Kans.
Barnes, A. E., Leavenworth, Kans.
Barrett, W. A., Kansas City
Barton, Neil, St. Louis
Barton, Neil K., Memphis, Tenn.
Bell, D. J., Kansas City
Benneker, R., Chicago, Ill.
Bergstrom, M. H., Chicago, Ill.
Bieger, Don, Kansas City
Billman, Paul, Jefferson City
Blount, Chas. W. Independence
Bond, Ben, Kansas City
Breckenkamp, A. W., St. Louis
Bruce, C. H., Springfield
Brunkhorst, Ruth, Kansas City
Burch, J. A., Kansas City
Burns, P. L., Kansas City
Butler, E. W., Kansas City, Kans.
Carter, Evelyn, Kansas City
Casey, H. M., Kansas City
Cassell, Louis, New York, N. Y.
Catayoc, R., Kansas City
Clark, J. F. Jr., St. Louis
Cullen, Robert, Springfield
Cushing, Gene, St. Louis
Dingman, Virginia, Kansas City
Doyle, G. D., Kansas City
Ducker, Inez Meek, Kansas City
Dugay, Myrtle L., Jackson, Mich.
Dumas, E. L., St. Louis
Dumas, Mrs. E. L., St. Louis
Eaton, Charles T., Kansas City
Ericson, C. E., Kansas City
Feeley, W. J., Arlington, Va.
Fink, H. F., Kansas City
Forney, George, Kansas City
Fortner, M. A., Kansas City
Fossieck, Byron E., Summit, N. Y.
Foster, Howard, New York, N. Y.
Fritts, R. M., Kansas City
Gantt, Ed, Kansas City
Genz, Fred W., San Bruno, Calif.
Geronsin, H. C., St. Louis
Gleason, D. R., Kansas City
Glenn, S. S., Kansas City
Goetze, R. G., Kansas City
Goins, George B., Kansas City
Golden, Howard M., Kansas City
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Griffin, Paul R., Kansas City
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Haas, Edwin, Kansas City
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Hansen, Harry, Kansas City
Harris, Bill, Kansas City
Harrison, D. T., Kansas City
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Hatchett, Ray C., St. Louis
Haynie, Robert B., Kansas City
Hazelwood, Bob, Kansas City
Helget, E. K., Omaha, Nebr.
Hendrickson, Leith, St. Joseph
Henry, Darrel A., Brooklyn, N. Y.
Hicks, Claude, Kansas City
Holder, R. W., Kansas City
Holzapfel, Paul, Kansas City
Hoskins, W. B., St. Louis
Hunsaker, Patricia, Kansas City
Inman, D. O., Springfield
Jenkins, John, St. Louis
Kaempf, Walt, Kansas City
Kerns, V. L., Kansas City
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Knott, O. W., Des Moines, Ia.
Kozak, F. J., Richmond, Va.
Kozlicka, Frank, New York., N. Y.
Kramer, C. Ben, Kansas City
Lake, Lorraine, St. Louis
Lane, S. H., St. Louis
Langford, Betty, Kansas City
Leder, R. E., Kansas City
Levezue, C. F., Wichita, Kans.
Lieser, W. Wayne, Kansas City, Kans.
Logan, George E., Kansas City
Long, Mason, Kansas City
Luther, H. W., Kansas City
Luthy, R. G., Kansas City
Luzier, Neal, Kansas City
McCarthy, Don, Kansas City
McCurdy, J. E., Topeka, Kans.
McDermott, Betty, Kansas City
McFarland, B. V., Kansas City
McIntyre, Bob, Kansas City
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Mautz, Dayle, Independence
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Militzer, G. G., Springfield
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Mueller, J. H., Chicago, Ill.
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Nisely, James, Kansas City
Noel, Jerry, Kansas City
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O'Connell, Joe, St. Louis
Oppegard, Al Jr., Kansas City
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Poston, R. F., Chicago, Ill.
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Schweitzer, Wm. A., Kansas City
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Scott, Mrs. W. C., Kansas City
Scruby, Wm. L., Kansas City
Shelley, Harold, Sedalia
Shelton, H. I., Kansas City
Sherden, Lloyd R., Kansas City
Sherman, C. N., Kansas City
Shull, Clarence E., Brooklyn, N. Y.
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Simpson, H. K., Kansas City
Sloan, Dick, Kansas City
Smart, Boots, Kansas City
Smith. Ollie L., Nashville, Tenn.
Smith, R. W., Kansas City
Spencer, L. H., Kansas City
Stafford, Russ, Kansas City
Stockford, Eileen, Jackson, Mich.
Straub, Mary, Kansas City
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Thompson, J. W., Kansas City
Toussaint, L. L., Kansas City
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Wells, Ray E., Kansas City
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Whitney, Mrs. J. B., Kansas City
Wollaston, John, Overland Park, Kans.
Wood, H. L., Kansas City
Woods, R. J., Kansas City
Wyly, W. J., Kansas City
Young, I. M., Kansas City

Guests (including nurses in physicians offices, wives of members, newspaper and radio representatives)—152

Medical Technologists—111

Abts, Mary, Kansas City
Sister Agnes Maureen, St. Louis
Alig, Helen, Kansas City
Sister Amabilis, Kansas City
Sisiter Mary Ancilla, Kansas City
Sister Anna Cecilia, Kansas City
Barker, Claire, Kansas City
Sister Mary Bernard, Boonville
Birts, Jeane, Kansas City
Boatright, Lee, Kansas City
Boehm, Lorine, St. Louis
Boehmer, Edith, Sugar Creek
Brown, B. R., Kansas City
Brunner, Lois, Kansas City
Byrd, Roberta, Kansas City
Sister Carmelita, Maryville
Carr, Marie, Leavenworth, Kans.
Carter, Jannette, Kansas City
Chase, Carrie, Kansas City
Clark, Doris, Kansas City
Clark, Wm., Leavenworth, Kans.
Cline, Jean, Kansas City
Coates, Jane, Kansas City
Cogdill, Erma, Kansas City
Colley, Aldine R., Columbia
Creager, Rachael, Kansas City
Darracott, F., St. Louis
Daugherty, Lillian, Kansas City
Dave, Billie, Kansas City
Donegan, Mary Ellen, Kansas City
Drizos, Matia, Kansas City
Eldridge, Evelyn, St. Louis
Sister, Mary Eligia, Ironton
Ennis, Sue, Kansas City
Fabac, Nita, Kansas City
Fangman, Phyllis, Kansas City
Foster, Philome, Kansas City
Fowler, Shirley, Kansas City
Geraghty, Joan, Kansas City
Giffin, Mildred, Kansas City
Greenlee, Gwen, Kansas City
Gwin, Dorothy, Kansas City
Halbig, Lois, Kansas City
Hardin, Evelyn W., St. Louis
Hedges, Anna, Wadsworth, Kans.
Higgs, Marv Ellen, St. Joseph
Hodge, Julia. St. Louis
Sister Mary Inez, Kansas City
Sister Mary Irmena, Jefferson City
Jenkins, Berenice C., Kansas City
Joyce, Barbara K., Kansas City
Kennedy, Melba, Kansas City
Klasinski, Helen, Wadsworth, Kans.
Kochevar, Lillian, Kansas City
Koontz, Genevieve, Kansas City
Koster, Bernice, St. Louis
Kramer, Hildegarde, St. Louis
Kramer, John E., Leavenworth, Kans.
Kroenert, Louise, Kansas City
Kuhl, Elaine, Kansas City
Kushner, Barbara, Columbia
Lighthall, Helen Jo, Kansas City
Limberg, Dorrel, St. Louis
List, Betty, Leavenworth, Kans.
Lynch, Mary M., Kansas City
McNabb, LaVerne, Kansas City
Mayes, Sue, St. Louis
Messina, Mary, Kansas City
Miller, Marda, Kansas City
Milligan, Deloris, Kansas City
Minter, Frances, Kansas City
Missel, Bernadine, St. Louis
Morgan, Philip, Kansas City
Mullin, Barbara, Kansas City
Murotake, Phyllis, Kansas City
Murphy, Audrey, St. Louis
Murphy, Margaret, Kansas City
Nelson, Clyde H., St. Louis
O'Connell, Louise, Kansas City
Oswald, Mildred, St. Louis
Owens, Marguerite, Kansas City
Pahmeier, Lydia, St. Louis
Parker, Rena M., Kansas City
Peuker, Lawrence, Horton, Kans.
Reeble, Margaret, Kansas City
Reed, Esther, Kansas City
Rippey, Erma, Wadsworth, Kans.
Robinson, Louann, Kansas City
Sanger, Kathryn, Atchison, Kans.
Schneider, Emily Ann, St. Charles
Schutte, Josephine, Kansas City
Settlemoir, Patricia, Columbia
Sharbel, Mary, Kansas City
Singer, Gwendolyn, Kansas City
Smith, Ann, Kansas City
Smith, Marjorie, Kansas City
Sommer, Anne, St. Louis
Strickler, Joey, Kansas City
Stoltenberg, Eunice, Kansas City
Stoskopf, Mary, Joplin
Sunderwirth, Ruby, Kansas City
Sutton, Betty Lou, Boonville
Thomas, Patricia, St. Louis
Wamsley, Kenneth, Kansas City
Weisenfeld, Anita, St. Louis
Wells, Louise, Kansas City, Kans.
Wesley, Mary Elizabeth, St. Louis
Wheeler, Mary E., Kansas City
Wood, David, Kansas City
Wright, Lucile, Kansas City
Zeugin, Margaret, Wadsworth, Kans.

Total Registration—1211

BOOK REVIEWS

Current Therapy 1950, latest approved methods of treatment for the practicing physicians. Editor—Howard F. Conn, M.D. Consulting Editors—M. Edward Davis, Vincent J. Derbes, Garfield G. Duncan, Hugh J. Jewett, William J. Kerr, Perrin H. Long, H. Houston Merritt, Paul A. O'Leary, Walter L. Palmer, Hobart A. Reimann, Cyrus C. Sturgis and Robert H. Williams. W. B. Saunders Company. Philadelphia and London. 1950. Price $10.00.

The 1950 edition of "Current Therapy" follows the general plan and format of the 1949 edition. While much of the material is unchanged, "Sixteen new subjects are included, with a new section on Diseases of the Locomotor System; forty new contributors have written articles for the current volume." There are "more than 250 contributors represented" and many of them are distinguished members of the medical profession.

In the treatment of some illnesses, the contributors exhibit marked differences of opinion. A case in point is "Syphilis of the Nervous System." Dattner (of New York University) says penicillin alone is used at the Rapid Treatment Center at Bellevue. Kierland (at the Mayo Clinic) seems inclined toward Penicillin plus fever therapy and Bennett (at the University of California in Berkeley) lists all the older forms of treatment, including arsenic, bismuth, iodide, fever and penicillin.

The book is well written and both internists and general practitioners will find it a handy and useful reference.

B. S. P.

The Mask of Sanity. An attempt to clarify some issues about the so-called psychopathic personality. By Hervey Cleckley, M.D., Professor of Psychiatry and Neurology, University of Georgia School of Medicine, Augusta, Georgia. Second Edition. The C. V. Mosby Company, St. Louis. 1950. Price $6.50.

This book deals entirely with the clinical entity of "psychopathic personality," a condition formerly designated as "constitutional psychopathic" state. This second edition has been completely rewritten and is greatly enlarged. This is undoubtedly the most complete work to be found on this subject. The psychopathic personality is discussed in all its manifestations, both complete and incomplete.

Many case histories are given in detail and make interesting reading. Included is a chapter on "the psychopath as psychiatrist." There is a complete differential diagnosis, brief chapters being devoted to various conditions with which the psychopathic personality may be confused. Probably of most interest to the average physician is a series of sixteen brief chapters describing the various reactions and findings of the psychopathic personality. This section is listed as "Clinical Profile"; the index alone gives a good description of the condition. The theoretic etiologic and therapeutic aspect of the psychopath is also dis-

cussed. These, however, appear rather involved and are probably of interest only to those working in this field. There is an extensive bibliography. J. R. E.

EYE AND ITS DISEASES, by 92 International Authorities. Edited by Conrad Berens, M.D., F.A.C.S., Managing Director of The Ophthalmological Foundation, Inc.; President, Snyder Ophthalmic Foundation; President, American Academy of Ophthalmology and Otolaryngology; Diplomate and former Member, American Board of Plastic Surgeons; President, Pan American Association of Ophthalmology; Fellow of the American Ophthalmological Society; Fellow of the American Illuminating Engineering Society; Fellow of the Aero-Medical Association; Vice-President, National Society for the Prevention of Blindness; Vice-President, International Society for the Prevention of Blindness. Second Edition, with 436 Illustrations, Eight in Color. W. B. Saunders Company, Philadelphia and London. 1949. Price $16.00.

This is the second edition of this well known textbook, the first having been published in 1936. Its ninety-two contributors include many who are international authorities on the subjects which have been assigned to them.

It attempts to cover the entire field from the embryology, anatomy and postnatal development of the eye, through the physiology, refraction and diseases of the eye to surgery, preventive ophthalmology and laboratory diagnosis. Because of this its sections are necessarily sketchy and incomplete, but there are some which are exceedingly well written, even though abbreviated. An excellent bird's-eye view of the subject is given but, because of the incompleteness of some of the chapters, its usefulness as a reference source is reduced.

As an introduction to ophthalmology it serves a useful purpose. For those who wish to have available a single textbook of ophthalmology it is highly recommended and, for the ophthalmologist, there are certain sections which make it a welcome addition to his ophthalmological library. D. B.

PENICILLIN, Its Practical Application, under the general editorship of Professor Sir Alexander Fleming, M.B., B.S., F.R.C.P., F.R.C.S., F.R.S.; Professor Emeritus of Bacteriology, University of London; Principal, Wright-Fleming Institute of Microbiology, St. Mary's Hospital Medical School, London. Second Edition. Butterworth & Co. (Publishers) Ltd., London, England. C. V. Mosby Company, St. Louis. 1950. Price $7.00.

This second edition of Fleming's book went to press in December 1949, at which time penicillin had no equal in the treatment of certain infectious diseases. At the present time, however, one wonders whether penicillin is sufficiently important to justify a book of this size, almost five hundred pages. The form of this book is that of subdivision of diseases according to special systems, such as dermatology and eye infections. Emphasis is placed on type of organism that is likely to be found in various lesions, and in this respect the work is similar to that of a clinical bacteriology. This is an excellent plan, and I believe the book derives its chief values from this type of presentation. However, far too little is said about the contraindications for penicillin therapy. For example, in the section on dermatology, the reader is encouraged to use penicillin locally in salve and ointment form, and formulas are given in detail; however, less than one page is devoted to a consideration of the serious reactions that may follow such a regime. In the section on enteric infections there is no discussion of the inadvisability of using penicillin in infections due to penicillin-resistant gram negative rods. C. J. S.

A TEXT-BOOK OF X-RAY DIAGNOSIS, by British authors, in four volumes, Second Edition. Edited by S. Cochrane Shanks, M.D., F.R.C.P., F.F.R., Director, X-ray Diagnostic Department, University College Hospital, London; and Peter Kerley, M.D., F.R.C.P., F.F.R., D.M.R.E., Director, X-ray Department, Westminster Hospital; Radiologist, Royal Chest Hospital, London. Volume IV. With 553 illustrations. W. B. Saunders Company, Philadelphia and London. 1950. Price $15.00.

These authors are leading roentgen diagnosticians of England. They have produced a four volume system of x-ray diagnosis by seventeen of the authoritative radiologists of the British profession. Volume IV dealing with the bones, joints and soft tissues has 952 pages and 533 illustrations. There is a large amount of new material that has been gathered during and following the last war which has forced a complete rearrangement. The new lithographs are brilliant. They are similar to the excellent illustrations of roentgenograms in the *British Journal of Radiology*. The editors, Shanks and Kerley, are commanding figures and stand out amidst their professional colleagues with a poise and dignity that carries on with British tradition.

There is evidence in this volume of a spirit of cooperation between radiologist and surgeon that is admirable and advantageous to the patient as well. Not only are the methods of clinical and roentgenologic analysis of diagnostic films discussed but the results of surgical procedures illustrated. The anatomic background and the pathologic opacities are never neglected. If Volume IV is an example of the other three volumes this complete set will provide a startling roentgenographic parade of British radiology that can only redound to their everlasting credit. E. H. S.

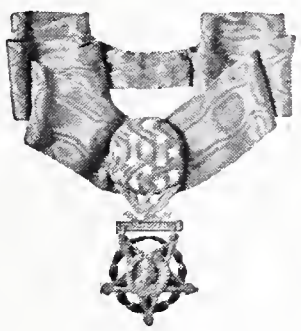
THE NEUROSES, Diagnosis and Management of Functional Disorders and Minor Psychoses, by Walter C. Alvarez, M.D., Professor of Medicine, Emeritus, Mayo Foundation, University of Minnesota; Emeritus Consultant in Medicine, the Mayo Clinic. W. B. Saunders Company. Philadelphia-London. 1951. Price $10.00.

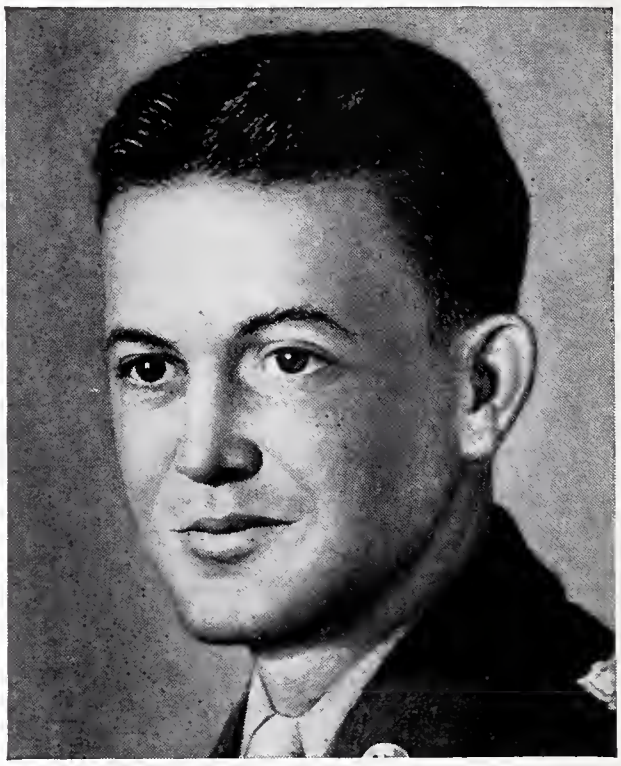
For many years Dr. Alvarez has been carrying on a more or less thankless campaign for a more rational attitude toward the borderline and neurotic status by the average or nonpsychiatric practitioner. The ideas and practices he advocates are essentially sound and helpful and no doubt he has accomplished a great deal for both the patient and the doctor. In this book he has evidently tried to gather the accumulated wisdom of long experience and present it so all may understand.

Special parts of the book are prepared with the needs of specialists in mind. The mass of material is collosal running to some 600 pages. One only hopes that the busy practitioner will take the time to find his way through the pages and come forth with the lessons he particularly needs. Really the education of doctors in these matters should begin in the medical school. L.B.A.

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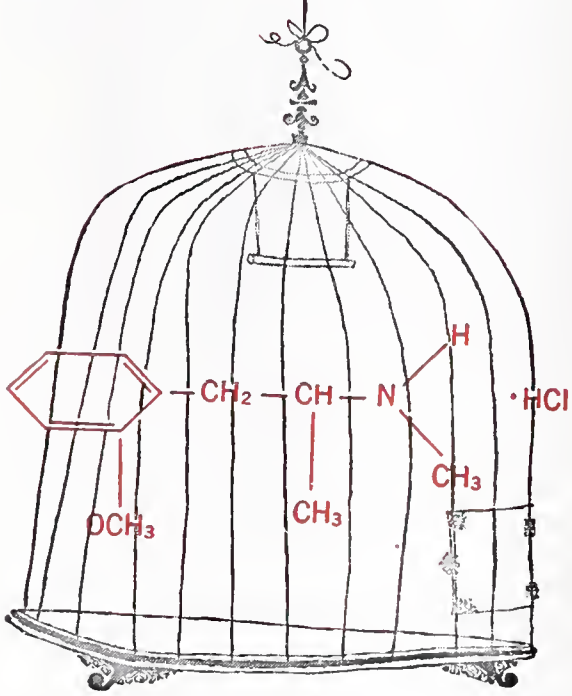
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1. Jeans, P. C.: Feeding of Healthy Infants and Children, J.A.M.A. *142*:806 (Mar. 18) 1950.

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Glass, S. J., and Rosenblum, G.: J. Clin. Endocrinol. 3:95, 1943.

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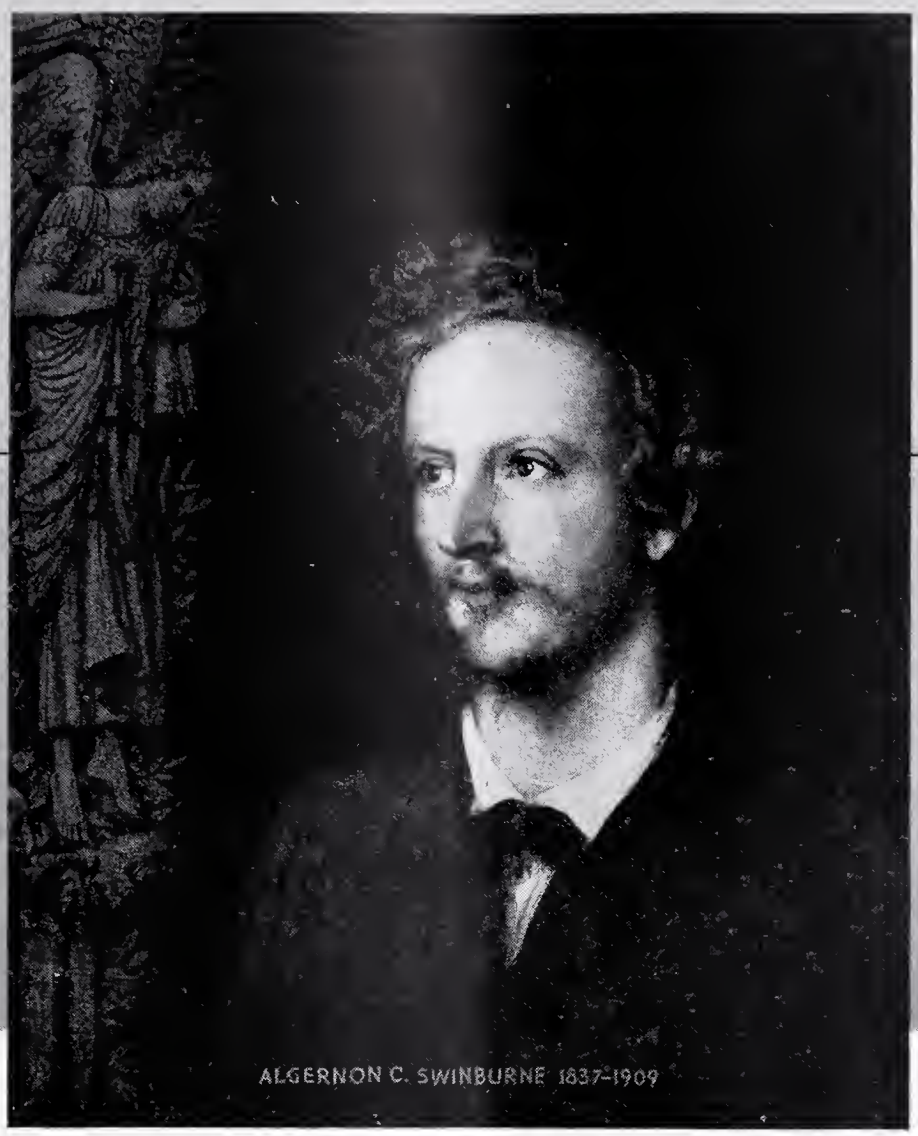
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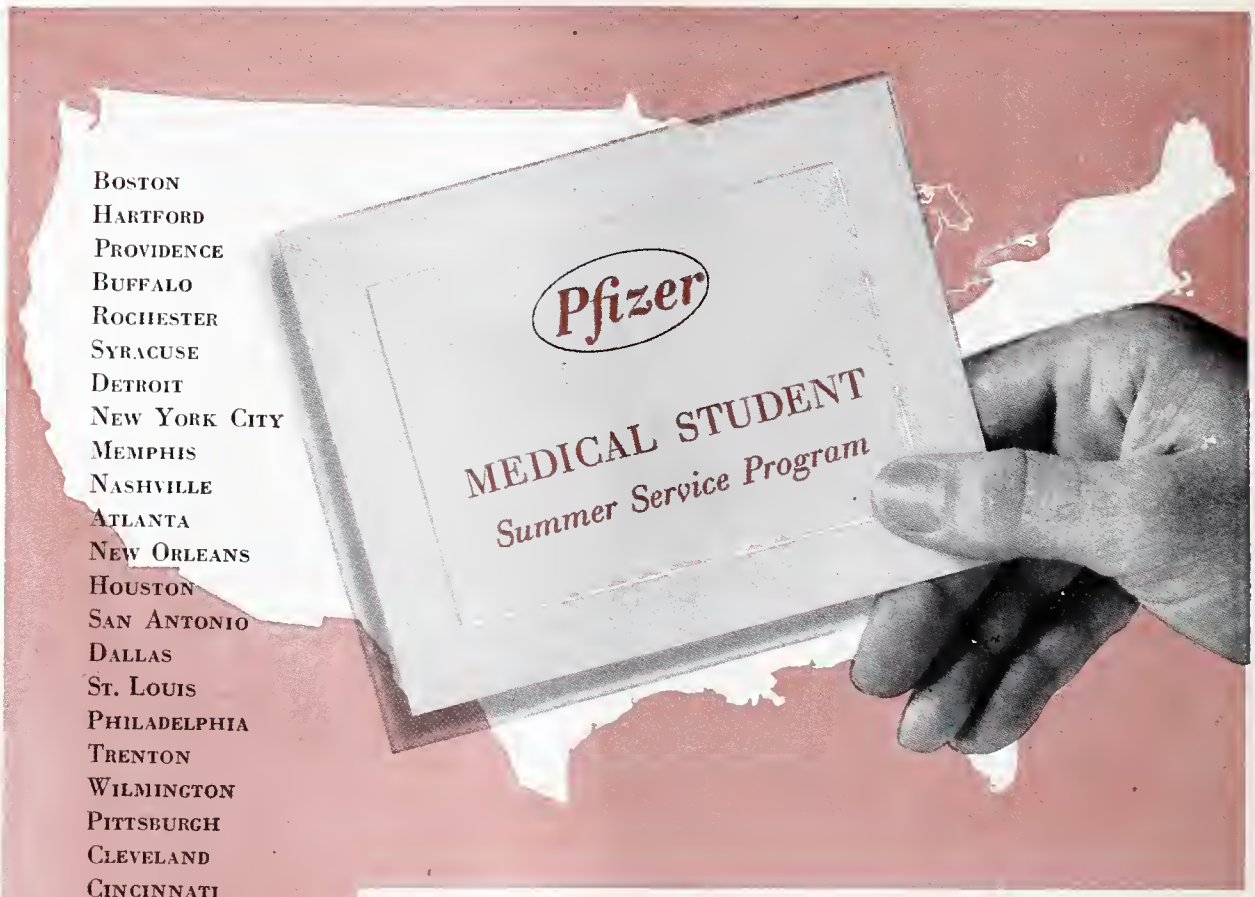
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Scientific Articles

SARCOIDOSIS

ANDREW L. BANYAI, M.D.
MILWAUKEE, WIS.

In the *Annals of Clinical Medicine*, sarcoidosis of the lung is being recorded with increasing frequency. It is recognized that sarcoidosis is a systemic disease. Bedside examinations as well as postmortem studies show that it may involve virtually every part of the body. Typical lesions may be localized in one site of an organ or system or the disease may manifest itself in simultaneous involvement of various systems of the body. The most frequently observed sites of the affection are the skin, superficial and deep seated lymph nodes, including the mesenteric and retroperitoneal groups, the lung, spleen and small and long bones (with equal frequency and often symmetrically), the uveal tract of the eye (iritis or iridocyclitis) and the parotid gland.

The most conspicuous characteristic of sarcoidosis is the so-called hard tubercle. It is a sharply demarcated granulomatous structure, the microscopic examination of which reveals the following findings: (1) Accumulation of palely-staining, polygonal epithelioid cells which may show a mosaic pattern in the center and a concentric arrangement at the periphery. (2) Within the cluster of epithelioid cells, giant cells of the Langhans type are common but not always present. The number of nuclei in these cells may be as high as thirty. Also, sometimes the giant cells of sarcoid contain irregularly shaped or oval, laminated, deeply staining, basophilic inclusions of various sizes, with asteroid projections, first observed by Schaumann (1941). (3) Sometimes, a few scattered lymphocytes are noted at the periphery or none at all. This observation explains the origin of the term "naked tubercle." (4) Nickerson (1937) called attention to the presence of a recticulum in the sarcoid nodules. (5) Changes simulating slight necrosis may occur in these globular structures but caseation is always absent. (6) The fully developed sarcoid nodule is preceded by focal congestion with the appearance of lymphocytes and by the subsequent accumulation of monocytes. (7) Healing of the granulomatous lesions of sarcoidosis may ensue by complete resorption or by fibrosis.

Postmortem examination of the lung affected with sarcoidosis reveals the following pertinent findings. From pinpoint to pea sized nodules may be seen on the surface. On palpation the lung feels firm and nodular. The lung may be contracted due to fibrosis. The cut surface shows nodules varying in size from 2 to 5 mm. Cavity formation is infrequent but cavities of medium and even of large size have been observed on necropsy in patients with sarcoidosis and without tuberculosis. The hilar lymph nodes are enlarged or they may be reduced in size by fibrotic induration. On histologic inspection, one finds loss of the parenchyma in consequence of sarcoid nodules, netlike, stringlike or massive areas of fibrosis. Fibrosis may cause narrowing of the lumen or complete obliteration of capillaries, small blood vessels, bronchioles and bronchi. In some instances, bronchiectasis results from pulmonary fibrosis; in others, compensatory emphysema may be noted. Also, the pleura may be affected. In rare instances, pleural effusion develops on one side or, as it happened in one of my cases, consecutively on both sides.

Possible complications include spontaneous pneumothorax, paralysis of the phrenic nerve due to pressure of enlarged mediastinal lymph nodes, purpura, toxic erythema and erythema nodosum. The latter is nontender, is not associated with pruritus and lasts for a few weeks. Simultaneously with or independently of the pulmonary lesion, sarcoid nodules may develop in other vital organs. The function of the latter may be disturbed by the replacement of specific tissues by sarcoid nodules or by the pressure of sarcoid masses. Involvement of peripheral superficial lymph nodes occurs some time during the course of sarcoidosis in nearly 100 per cent of the cases. The implicated lymph nodes are enlarged, often to a considerable

Presented at the 93rd Annual Session, Missouri State Medical Association, Kansas City, April 22-25, 1951.

size, and are firm, rubbery, nontender and nonadherent to the surrounding structures. Retrobulbar localization of the disease may cause unilateral exophthalmos. Central nervous system involvement may lead to symptoms of encephalitis or cranial nerve paralysis. Findings suggestive of diabetes insipidus may result from sarcoid changes in the hypophysis. Arrhythmias, conduction defects and myocardial failure may follow sarcoid infiltration of the heart muscle. Strain and failure of the right side of the heart may result from extensive perivascular pulmonary fibrosis brought about by sarcoidosis of the lung as noted on necropsy. Cardiac decompensation is made worse by the pressure of enlarged hilar and mediastinal lymph nodes upon the auricles and the large blood vessels. Enlargement of the liver and the presence of icterus are more readily attributed to diseases other than sarcoidosis. Splenomegaly with leukopenia and thrombocytopenia may suggest Banti's disease, aplastic anemia or essential thrombocytopenia. There may be a spontaneous complete disappearance of splenomegaly during the course of the disease. Involvement of the kidneys may simulate the clinical picture of subacute glomerulonephritis with azotemia. Cases are on record in which sarcoidosis led to the development of Still's syndrome.

A great deal of time and effort has been devoted to the clarification of the etiology of sarcoidosis. Even so, there is no consensus applicable to the origin of this disease. On the basis of the available studies of others and of my own experience, I am inclined to agree with the concept of Sulzberger (1933). He said that "an attempt to deny the tuberculous etiology of sarcoidosis would represent a decided step backward and a denial of the conclusions reached through years of study and experiment by trained observers."

The incidence of sarcoidosis is highest in young adults and persons of middle age. It is rarely seen in children. The youngest patient reported with sarcoidosis was an infant of 3 weeks, the oldest, 85 years of age. Both sexes are affected with equal frequency, although some reports are suggestive of its predominance in females. In the United States, sarcoidosis occurs in the Negro far above their ratio in the general population. In Europe, there seems to be a higher incidence in the Scandinavian countries than elsewhere.

SYMPTOMS

One should always keep in mind the possible kaleidoscopic, bizarre combination of clinical manifestations of sarcoidosis. As far as pulmonary sarcoidosis is concerned, one cannot help but be impressed by the lack of constitutional and localizing symptoms and by the discrepancy between the paucity of symptoms and the relatively extensive involvement of the lung. Since the initiation of mass x-ray surveys of the chest, a number of typical cases of sarcoid involvement of the chest have been discovered in individuals who have no symptoms at all. In the average case, fever is usually absent, although, in some instances, chills and moderately elevated temperature are observed. These may be associated with night sweats. In rare instances of acutely progressive sarcoidosis, the fever is high. Undue fatigue of long duration may be complained of. Loss of weight is usually absent, but in rare instances, it may reach as much as 50 pounds. Cough is not a frequent complaint. When cough is present, it is, as a rule, unproductive. In some instances, one may note the occurrence of mucopurulent expectoration, blood streaked sputum, even frank pulmonary hemorrhage. Sharp pain in the chest is a rare symptom. It is brought about by sarcoid involvement of the pleura. Dyspnea and cyanosis may result from the following causes: (1) extensive pulmonary involvement with or without fibrosis, (2) sarcoid infiltration of the myocardium, (3) interference with the normal cardiac function by the pressure of enlarged hilar and mediastinal lymph nodes, (4) chronic cor pulmonale secondary to the marked displacement of the lung tissue by sarcoid nodules or resulting from widespread perivascular fibrosis. Failure of the right side of the heart was caused by histologically ascertained endarteritis of the pulmonary vessels in the case reported by Tice and Sweany (1941). Obesity not infrequently encountered in patients with sarcoidosis is bound to aggravate cardiorespiratory insufficiency.

Other premonitory or concurrent symptoms and findings add to the protean behavior of this disease. These include, singly or in combination, such items as headache, facial paralysis, unilateral exophthalmos, polyuria, somnolence, sopor, lethargy, muscle pain, swollen joints, gastrointestinal disturbances, skin changes in the form of light red or violaceous patches, nodules or diffuse infiltration chiefly on the extensor surface of the forearm or legs and on the face, herpes zoster or generalized purpura. The skin lesions never ulcerate. Some of these skin changes may completely disappear when pulmonary involvement develops. Also, there may be swelling of the fingers or painless enlargement of the lymph nodes. Some of these patients relate that they had had abdominal operations without benefit as far as their abdominal distress was concerned.

DIAGNOSIS

On physical examination of the chest of an early case of pulmonary sarcoidosis, no abnormal signs are detectable. Massive enlargement of the hilar and mediastinal lymph nodes may be recognizable from dullness on percussion and bronchovesicular breathing over the manubrium of the sternum or in the interscapular area. When the pulmonary lesion is extensive, signs of infiltration are noted such as respiratory lag on one side, with increased tactile fremitus and vocal resonance. Sonorous and sibilant rales are audible in cases with compression of some of the bronchi by enlarged lymph

nodes. Compensatory emphysema is found in the advanced stages of the disease.

Systematic survey of the entire body is mandatory in every patient suspected of having sarcoidosis. One should carefully examine the skin and search for enlarged superficial lymph nodes. Skin lesions of the cheek and extremities are usually symmetrical. Erythema nodosum occurs in about 20 per cent of the cases. Also, one should check the patient for possible involvement of the eye and salivary glands, particularly in the form of Mikulicz syndrome and Heerfordt syndrome.

Splenomegaly and hepatomegaly, separately or jointly, are found with varying frequency. According to Reisner (1944) enlargement of the spleen noticeable early in the course of the disease is likely to disappear with the progression of sarcoidosis.

On the basis of roentgenologic studies, four types of thoracic sarcoidosis have been described.

1. Massive, lobulated, soft appearing enlargement of the hilar and paratracheal lymph nodes may or may not involve the perihilar lymphatics. The roentgenogram reveals a butterfly appearance or what was aptly called "potato nodes" by Snapper and Pompen (1938). The lymph node involvement is bilateral and symmetrical. Rarely, however, the disease is localized in one hilar region. In a considerable percentage of the cases, there is a pronounced enlargement of the paratracheal lymph nodes on the right side as compared with the opposite side. This finding may be only apparent or may represent actually greater involvement of these structures on the right side. It may be apparent because of better visual accessibility of mediastinal structures on the right side. It may be real, for the right lung being larger in volume than the left, it is supplied with a more abundant lymphatic system, including corresponding lymph nodes. On account of the larger size of the right lung, there is a possibility of heavier retrograde flow of lymph from the right hilar nodes. Large hilar and mediastinal lymph nodes may cause compression of some of the bronchi or of the esophagus. Limited enlargement of hilar and mediastinal lymph nodes is readily demonstrable in x-ray films taken in right or left oblique projection or with the aid of the Bucky diaphragm or tomograph.

2. Enlargement of the hilar and mediastinal lymph nodes in sarcoidosis may be associated with peribronchial, perivascular and interlobular infiltration or fibrosis which gives the appearance of radiation from the hilum toward the periphery or brings about a netlike reticulation in the lung fields. This roentgenologic picture resembles that seen in early silicosis, silicatosis and other noxious-dust diseases, in some instances of tuberculosis, lymphangitis carcinomatosa, diffuse post-influenzal pulmonary fibrosis, pulmonary congestion, syphilis and pulmonary arteriosclerosis.

3. The most frequently seen and generally accepted "typical" pulmonary sarcoidosis is represented by scattered, fine, micronodular densities, from 1 to 3 mm. in size. This roentgenologic picture, together with the rather slow course of the disease, prompted older clinicians to refer to it as granulie froide, granulie discrete, miliaris discrete and tuberculids of the lung. It is interesting to find that the apex and base of the lung are relatively free of these nodules which, as a rule, constitute an early manifestation of the disease. Purely from the roentgenologic viewpoint, the nodular type of sarcoidosis should be differentiated from a number of other conditions with similar x-ray appearance.

4. Pulmonary sarcoidosis may manifest itself in irregularly shaped, unevenly distributed or localized, patchy infiltration which is similar to tuberculous lesions and to bronchopneumonia of other bacterial, rickettsial, viral or parasitic origin. Also, it may resemble x-ray shadows seen in irradiation or oil pneumonia, Loeffler's syndrome and certain benign and malignant tumors. This type of sarcoidosis is most frequently localized in the middle and lower one third of the lung.

A combination of various roentgenologic manifestations or sarcoidosis of the lung may also be observed. Pulmonary sarcoidosis may be the presenting disease or it may develop subsequent to or in association with sarcoid lesions of the eye, parotid gland, the skin, lymph nodes and various other organs.

Pleural effusion, an uncommon finding in association with pulmonary sarcoidosis, is recognized from suggestive x-ray findings. Exploratory thoracocentesis offers confirmatory evidence. The effusion shows the characteristics of an exudate: specific gravity of 1016 or more, positive Rivalta test and protein, 4 per cent or more. Usually, lymphocytes predominate in the effusion.

Roentgenologic examinations are of value not only as an aid in diagnosis but also in following the course of the disease. (1) They reveal discrepancy between pulmonary findings on the one hand and the good general appearance of the patient and the scarcity or absence of local and constitutional symptoms on the other hand. (2) In serial roentgenograms of the chest, the benign, protracted course of the disease may be demonstrable. In some instances, no relevant change may be noticeable for years. (3) In other cases, one can observe the gradual decrease in the size of enlarged hilar and paratracheal lymph nodes and the subsequent development of widespread nodular changes in the lung fields. (4) Magnuson (1940) observed that on lateral roentgenograms of the chest, the nodules were more numerous posteriorly in silicosis, while in sarcoidosis, the opposite holds true. (5) In miliary tuberculosis the nodules are more numerous, more closely spaced and more discrete than in sarcoidosis. (6) In some instances, serial x-ray studies may reveal the gradual retrogression and complete disappearance of extensive lesions. (7) Nodular changes are

likely to decrease in number or vanish entirely when pulmonary tuberculosis supervenes.

Roentgenograms of the skeletal system should be taken in every suspected case of sarcoidosis. The carpal, metacarpal, tarsal and metatarsal bones seem to be predilectional sites for sarcoid, although other bones may be involved too. The bones affected may show small, usually solitary, round defects. The latter are actually pseudocysts caused by granulomatous tissue of sarcoid. The pseudocysts are localized in the cortex of the bone or may occupy the entire width of the latter. A widening of the involved bone may be noted. In the long bones, the diaphysis is the usual site of involvement. The lesion is visualized in the form of reticulation, trabeculation and rarefaction or as pseudocysts. There is no corresponding periosteal involvement or sclerosis of the affected area. Sinus formation does not occur in sarcoidosis. There may be change in the size and shape of the bone involved, such as increase in the width of the shaft and thinning of the cortex.

In addition to physical and x-ray examinations, there are other useful methods of diagnosis. Kveim (1941) reported that the intracutaneous injection of a sterile extract of sarcoid tissue produced a localized, nodelike thickening of the skin, which developed within one to several weeks after the injection. The nodule persists for weeks or months. Its histologic structure is identical with that of genuine sarcoid nodules found in patients suffering from this disease.

Tuberculin skin test is negative in from 60 to 85 per cent of cases with sarcoidosis. Lemming (1937, 1942) observed that in patients with sarcoidosis, the tuberculin skin tests were negative even after vaccination with BCG. In some instances, positive reaction is observed only to low dilutions of tuberculin. Assuming that sarcoidosis is caused by the tubercle bacillus, the negative allergic response to skin testing these patients with tuberculin is designated as positive anergy.

Adjunct laboratory findings show considerable variability and inconsistency to the great dismay of the physician in quest of confirmatory evidence of sarcoidosis. Examination of the blood frequently reveals leukopenia with neutropenia. In other instances, the number of white blood cells is normal or slightly elevated. There is no shift to the left in the Arneth-Schilling count. During the progressive phase of the disease, monocytosis is likely to be demonstrable, with consequent increase in the monocyte-lymphocyte ratio. Eosinophilia may be absent or the number of eosinophilic leukocytes varies from 6 to 36 per cent of the total white blood cell count. The eosinophilia is often transitory. In a number of cases, a marked decrease in the number of red blood cells and in the amount of hemoglobin, together with anisocytosis, is noted. With extensive pulmonary involvement, polycythemia is bound to develop. It is brought about by the markedly diminished functional capacity of the lung parenchyma. In one of my patients, pronounced thrombocytopenia with generalized purpura was the major clinical finding late in the course of the disease. The latter terminated fatally following splenectomy. Postmortem examination corroborated the diagnosis of sarcoidosis. Crane and Zeitlin (1945) saw a patient with hemolytic anemia caused by sarcoidosis.

The sedimentation rate of the erythrocytes is normal or moderately accelerated. In the latter instance, it becomes normal with healing.

The proteins of the blood serum are frequently increased. There is a shift toward decrease in or total reversal of the albumin-albumin ratio. The normal figures are: albumin from 4.6 to 6.7 per cent, globulin from 1.2 to 2.3 per cent; albumin-globulin ratio from 2.9 to 3.8. The increase in blood proteins is due to an increase in the beta and gamma fractions of globulin. Fisher and Davis (1942) consider increase in the globulin an indicator of the active phase of the disease. The albumin-globulin ratio returns to normal when healing sets in.

According to Harrell and Fisher (1939), elevation of the level of the blood calcium is frequent.

Harrell (1940) and Kirby and Armstrong (1944) reported that the amount of alkaline phosphatase in the blood was increased during the active stage of sarcoidosis.

Also, Harrell (1940) observed the presence of Bence-Jones protein-like substances in the urine of these patients.

When enlarged, superficial lymph nodes are found, a biopsy specimen should be taken for histologic examination. In the absence of enlarged lymph nodes, when there is reasonable suspicion of sarcoidosis, confirmatory evidence may be found on microscopic examination of a surgically removed, grossly normal looking lymph node. Daniels and Wilbur (1947) recommend securing an upper anterior mediastinal lymph node for biopsy, which can be reached through a short incision at the mesial region of the right supraclavicular fossa. The skin should be carefully palpated for subcutaneous nodules which are usually sharply demarcated. Their histologic examination may offer positive identification of the disease. Schaumann (1914) reported that the tonsils frequently were involved by specific changes in sarcoidosis. Thus, biopsy of the tonsils is an expedient method for the identification of the disease. But to the chagrin of the searching medical mind, this apparently easily accessible source of bioptic information may not be available for the simple reason that the tonsils had been removed previously. In the United States, this should not strike one as anything surprising, for tonsillectomy in this country is one of the most frequently performed operations. When the parotid glands are enlarged, biopsy specimen can be taken from one of them. Dressler (1938) first proved sarcoidosis by the aspiration of sternal bone marrow. He found typical epithelioid cell granulomas in the aspirated material. Even when the findings are negative for

sarcoidosis, bone marrow aspiration is a valuable diagnostic method in confirming or excluding blood dyscrasias. Buchem (1946) successfully utilized aspiration of biopsy material from the liver for establishing the diagnosis of sarcoidosis in eleven of his fourteen cases.

In patients with extensive pulmonary lesion, the vital capacity of the lung and its functional competency, as determined by special tests, are diminished greatly.

Electrocardiographic changes are readily detectable when myocardial sarcoid changes are present.

It is evident from this outline that a comprehensive survey of the entire body is essential for arriving at the correct diagnosis of sarcoidosis. In ruling out other diseases with similar clinical manifestations, one should avail himself of various specific skin tests, examination of the sputum and fasting gastric contents for pathogenic microorganisms, blood culture, agglutination and complement fixation tests, differential and total blood cell counts and other diagnostic methods. In some instances, it may be necessary to resort to angiocardiography or even to exploratory thoracotomy. The latter in expert hands is connected with no more surgical risk than exploratory laparotomy. Therapeutic test with x-ray irradiation is of questionable value in differential diagnosis: (1) because of the possible spontaneous retrogression of sarcoidosis; (2) on account of possible regressive changes under the effect or irradiation not only of sarcoidosis but also lymphomatoid diseases, such as Hodgkin's disease and lymphosarcoma involving the hilar and mediastinal lymph nodes.

PROGNOSIS

Sarcoidosis is notorious for its capricious behavior. Its course is unpredictable. It may last for from several months to as long as twenty years. Enlarged hilar and mediastinal lymph nodes may completely recede to their normal size. Also, extensive pulmonary involvement may clear entirely. Such train of events may be anticipated in about one third of the cases. Retrogression of pathologic changes, however, does not necessarily imply recovery. For reasons unknown, clinically satisfactory course of the disease may be interrupted by a flare-up in the lung or in some other part of the body. Bacilliferous (open) pulmonary tuberculosis is a frequent sequel in these patients, from several months to several years after the onset of sarcoidosis. Tuberculosis is the most frequent cause of death of patients with sarcoidosis. Also, fatal termination of the disease may be due to the following causes: (1) destruction of the hemopoietic system by sarcoid changes; (2) localization of the latter in vital organs with consequent irreparable damage which is incompatible with life; (3) cardiac decompensation brought about by extensive involvement of the lung, particularly when massive perivascular fibrosis results from sarcoidosis.

TREATMENT

The various methods and drugs advocated for the management of sarcoidosis are the unmistakable though regrettable expression of the fact that there is no uniformly potent means for the treatment of this disease. There have been numerous trials at curing sarcoidosis with ultraviolet irradiation, arsenicals, iodides, vitamin C, gold salts, tuberculin, hyperpyrexia and radium. Bernstein and Oppenheimer (1942) noted encouraging results from x-ray therapy. Curtis and his associates (1947) noted resolution of cutaneous and pulmonary manifestations of sarcoidosis with the administration of calciferol (vitamin D_2). Also, they observed great improvement in similar lesions from dihydrotachysterol. The efficacy of this treatment is attributed to increased excretion of phosphorus. With the loss of phosphorus, there is a consequent decrease in the phospholipids of the tissues. This treatment is based on the assumption that phospholipids may have causative connection with the formation of epithelioid tubercles of sarcoid. Snider (1948) reported on the striking regression of pulmonary and extrapulmonary forms of sarcoidosis under the influence of nitrogen mustard, methyl bis (betachloroethyl) amine hydrochloride. He administered 0.1 mg. of this drug per kilogram of body weight by the intravenous route daily for four days, repeating the same treatment after a month's interval. Nausea and vomiting occurred after each injection and a transient depression of the leukocytes to from 2,000 to 3,000 per cubic millimeter after each course. O'Leary (1949) endorses the use of ethyl chaulmoograte.

In a number of patients with sarcoidosis, I have used streptomycin, ethyl chaulmoograte and large doses of vitamin A. The therapeutic results have been disappointing.

Recent reports indicate pronounced improvement in the general and pulmonary manifestations of sarcoidosis following the use of adrenocorticotropic hormone (ACTH).

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INTRAVENOUS ADMINISTRATION OF PENTOTHAL SODIUM IN COMBINATION WITH OTHER ANESTHETIC AGENTS AND METHODS

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In spite of my early enthusiasm regarding the usefulness that pentothal sodium might attain as an anesthetic agent, I never imagined that it would become as useful as it has or that it would supplant other anesthetic agents and methods to the extent that it has.

The extensive use of this agent at the present time is due largely to the early recognition of the following: (1) that it has certain limitations when used alone as an anesthetic agent, and (2) that its margin of safety can be increased by using it in combination with other anesthetic agents and methods. Fortunately, pentothal sodium could be used readily in combination with other anesthetic agents and methods since it has little, if any, antagonistic action when used in this manner. When pentothal sodium is administered in this manner, the desirable actions of each agent can be obtained while the undesirable ones can be kept at a minimum.

Actually, it has not been so much a case of pentothal sodium's supplanting other anesthetic agents and methods as it has been of its complementing and supplementing them to the mutual advantage of one another. When pentothal sodium is used in combination with other anesthetic agents, some anesthetists depend on it to carry the major share of the anesthetic load while others use it merely to supplement another agent, that is, to produce basal narcosis.

In cases in which I use pentothal sodium in combination with nitrous oxide and oxygen, I use the pentothal sodium as the dominant anesthetic agent, using equal parts of nitrous oxide and oxygen to reduce somewhat the total dose of pentothal sodium. Stuart Cullen, in using the same combination, depends on a maximal concentration of nitrous oxide to carry most of the anesthetic load and uses a small dose of pentothal sodium to produce basal narcosis. Both methods are satisfactory. The dominant anesthetic agent depends on the choice of the individual anesthesiologist.

Another reason for the increased use of pentothal sodium is that it is noninflammable and nonexplosive. Fortunately, this desirable quality also pertains to several other agents which may be administered singly or in combination to produce general, local or regional anesthesia.

Perhaps the most outstanding adjunct to pentothal sodium has been curare and the various curare-like drugs. Curare has one inherent quality which pentothal sodium lacks, namely, the ability to obtund certain reflexes and thus produce adequate muscular relaxation when administered in therapeutic doses. Pentothal sodium will not produce such relaxation unless it is administered in excessive doses which would cause dangerous respiratory depression or apnea which results in various degrees of anoxia.

The untoward side effects of pentothal sodium have always been minimal. It does not untowardly affect the heart, liver or kidneys, or alter grossly the patient's normal metabolic picture or laboratory findings. Most of the difficulties encountered in pentothal sodium anesthesia have to do with overdosage, respiratory depression and the airway.

Similarly, the side effects of curare on the heart, liver, kidneys and metabolic processes are minimal; its central depressant effects are few, and, like pentothal sodium its undesirable effects arise from the administration of excessive doses which produce respiratory depressant phenomena similar to those caused by excessive doses of pentothal sodium.

Naturally, the combined effect of these drugs, both of which produce depression of respiratory activity, one centrally and the other peripherally, can be dangerous if due regard is not given to the balance between the doses of each drug and the combined effect of large doses of either drug or of both drugs. Acute respiratory depression is not hard to produce if the drugs are administered rapidly and with an insufficient pause between the administration of each drug.

One must bear in mind that, while the maximal effect of pentothal sodium is obtained in three or four minutes after its administration, the peak effect of curare does not occur until ten or twelve minutes after its intravenous administration. It therefore is obvious that if, in order to produce more relaxation, several doses of curare are administered at short intervals, the combined effect

* Read at the meeting of the Anesthesia Societies of Kansas City, Kansas, and Kansas City, Missouri, February 14, 1951, Kansas City, Kansas.

may result in an overdose. This rarely happens if the drug is administered in small doses and if a sufficient interval is permitted to elapse between the administration of the doses. If the drug is administered in this manner, it seldom is necessary to employ resuscitation or to neutralize the effect of the curare with prostigmine or other anticurare drugs.

It should be realized, however, that respiratory depression is likely to occur in any case in which curare is administered in combination with pentothal sodium. Certain other measures may be used in an effort to prevent the occurrence of such depression, or to combat it promptly if it should occur. The most important of these measures is the maintenance of a clear airway by any means that will be effective. Since the patency of the airway is so important, and since respiratory depression may occur quickly, it is vital to have the airway clear at all times. The best way to accomplish this is by inserting an endotracheal tube. I use it frequently in cases in which a major operation is performed and routinely in cases in which the operation is extensive or long, in cases in which the patient's physical condition is poor and in cases in which the position of the patient during the operation might tend to cause obstruction of the upper part of the respiratory tract.

The use of oxygen with pentothal sodium, alone or in any combined form, has become almost routine, and oxygen is as necessary an adjunct to intravenous anesthesia as it is to any type of inhalation anesthesia. To the oxygen, most anesthetists add nitrous oxide. While we usually use a mixture of approximately 50 per cent oxygen and 50 per cent nitrous oxide at the Mayo Clinic, I see no good reason why the proportion of nitrous oxide should not be increased provided it is not increased enough to cause anoxia.

Thus a combined method of anesthesia has been developed slowly for use in major operations. Pentothal sodium and curare are administered intravenously, and nitrous oxide and oxygen are administered by inhalation through an endotracheal tube. Local or regional anesthesia may be used with this method if it is felt that it will aid in producing relaxation or hemostasis, or that it will further decrease the necessary dose of pentothal sodium or curare and thereby shorten the period of recovery and decrease the incidence of postoperative pulmonary complications.

This method of anesthesia has proved extremely useful. It has the following advantages over many of the older methods: (1) it eliminates the danger of fire or explosion during anesthesia; (2) it will provide adequate relaxation for major operations in almost all cases; (3) anesthesia can be induced and maintained easily, and side effects occur only rarely; (4) when administered in appropriate doses, the agents used in this method are well tolerated by elderly and debilitated patients and by patients whose physical condition is poor, and (5) with the exception of advanced cardiac disease and, perhaps, certain intracranial operations, there are few contraindications to the use of this method of anesthesia in one form or another.

I am often asked whether the method is safe, and I know that many physicians do not think that it is. A few years ago I would have said it was not safe and that no method could be used so freely and so widely as this one is being used at present.

I have used this method of anesthesia in several thousand cases in which a wide variety of operations, including gastric resection and operations on the larynx with suspension laryngoscopy, have been performed. In these cases, the ages of the patients have varied widely and the physical condition of the patients has ranged from good to poor. Complications attributable to the anesthesia have been minimal. As a result of my experience in these cases, I am convinced that this method of anesthesia is safe. The surgeons have been pleased with the relaxation obtained and with the condition of the patients during the period of recovery.

With the exception of respiratory depression due to the administration of one of the anesthetic agents, which I consider avoidable, respiratory function has remained satisfactory at all times. Artificial respiration seldom has been required, and only in an occasional case has the administration of an anticurare drug been necessary. Since an intratracheal tube is inserted as soon as an adequate depth of anesthesia is obtained, artificial ventilation may be instituted promptly in cases in which respiratory depression occurs as a result of the administration of an overdose of pentothal sodium or curare, or because of hypersensitivity to either of these drugs. Spontaneous breathing usually will be resumed after artificial ventilation has been employed for a few minutes. Careful attention to the administration of these drugs will almost completely prevent the occurrence of respiratory depression.

The technic of administration varies somewhat with different anesthesiologists, although the general principles remain much the same. One of the leading differences is mixing the solutions of pentothal sodium and curare in the same syringe according to the method of Baird or administering them individually from separate syringes. Baird's system is simple and requires less apparatus, but I prefer to have control over the administration of each drug so as not to have to administer a fixed amount of pentothal sodium when it is the effect of curare that is needed. Separate administration of the two drugs seems to me to be more pharmacologically sound and to offer a finer degree of control.

Another controversial issue is whether a dilute solution of pentothal sodium should be administered continuously by the drip method or whether a 2.5 per cent solution of this drug should be administered by means of a syringe. I can see no objection to administration of a dilute solution

of this drug by the drip method except that it requires a more cumbersome apparatus. This might be objectionable, particularly in a busy hospital in which many patients have to be anesthetized in rapid succession. It is my opinion that the alleged advantages of this method do not offset the additional trouble and equipment. The effect of pentothal sodium in the body depends more on the dose given during any given period of time than on the concentration of the solution.

I use two types of apparatus. If it is anticipated that the patient probably will not require supportive therapy, such as the administration of fluids or blood during the operation, the two syringes with their extension tubes are connected to the needle by a simple Y-type connector. If it is anticipated that the patient will require intravenous administration of fluids for support, a special four way valve, placed a short distance from the intravenous needle, is used. Connected to the other three outlets are the tubes leading from the syringes containing the solutions of pentothal sodium curare, and from the bottle containing the supportive fluids, respectively. By turning the lever on top of the valve, an independent flow of any agent can be obtained. The valve rests in a special clamp attached to the armboard.

I continue to use a 2.5 per cent solution of pentothal sodium, which is administered by means of a syringe, as described previously. Although I have tried different preparations of curare, I still prefer a solution of d-tubocurarine chloride which contains 3 mg. of the drug per 1.0 cc. Dimethyltubocurarine iodide also has proved satisfactory. Although it is somewhat less potent than d-tubocurarine chloride, it has less tendency to cause respiratory depression.

For premedication, 1½ grains (0.1 gm.) of pentobarbital sodium are administered orally on the night before the operation, and a similar dose is administered on the following morning, an hour and a half before the operation. Half an hour before the operation, 1/6 grain (0.01 gm.) of morphine sulfate and 1/150 grain (0.00043 gm.) of atropine are administered subcutaneously.

The proper sequence for the administration of pentothal sodium and curare is a controversial question. Many anesthesiologists prefer to administer the curare first, and to administer enough of this drug to produce the maximal therapeutic effect before they administer pentothal sodium to induce anesthesia. This procedure has one disadvantage, namely, the maximal therapeutic effect of curare is somewhat unpleasant for the patient if it occurs while he is still awake. For this reason, I prefer to start the anesthetic procedure by administering a hypnotic dose of pentothal sodium. The administration of curare is started as soon as the patient is asleep.

Intravenous injection of from 1 to 3 cc. of solution of d-tubocurarine chloride (3 to 9 mg. of d-tubocurarine chloride) and 20 cc. of a 2.5 per cent solution of pentothal sodium, 0.5 gm. of pentothal sodium) usually will produce sufficient relaxation and anesthesia to permit intubation. It may be necessary to administer 5 cc. of the solution of d-tubocurarine chloride (15 mg. of d-tubocurarine chloride) and 40 cc. of the 2.5 per cent solution of pentothal sodium (1 gm. of pentothal sodium) before the peritoneum can be opened. It seldom is necessary to administer more than 7 cc. of the solution of tubocurarine chloride (21 mg. of d-tubocurarine chloride) and 80 cc. of the solution of pentothal sodium (2 gm. of pentothal sodium) in the course of any operation.

In cases in which anesthesia is induced slowly, that is, in a period of five to seven minutes, anesthesia will be more satisfactory, relaxation will be better and respiratory depression will be less pronounced than they will be in cases in which anesthesia is induced more rapidly. In addition, smaller amounts of both curare and pentothal sodium will be required since the reflexes will be obtunded before the operation is started.

Although laryngospasm can be a troublesome complication, it has occurred in only a small number of the cases in which I have used this type of anesthesia, and it rarely has been severe. There are several precautions that may be employed in an effort to prevent the occurrence of this complication or to control it in cases in which it does occur.

Anesthesia should be induced slowly, and it should be permitted to reach an adequate depth before the patient is moved or prepared for the operation, and before any surgical manipulation is undertaken. If the patient is under only light anesthesia, painful stimulation often will cause spasm of the vocal cords. Manipulation about the head and neck, insertion of an airway or an attempt to insert an endotracheal tube also may cause laryngospasm if the anesthesia is light. Inadequate premedication, particularly with atropine, is another cause of this complication. The same may be said for premedication that is poorly timed. Although mucus in the throat may irritate the vocal cords, it should not be aspirated until the pharyngeal and laryngeal reflexes have been obtunded. If an intratracheal catheter is inserted before these reflexes have been obtunded, it may cause a laryngospasm.

These precautions will do much to prevent the development of this complication. The value of spraying the throat with a 10 per cent solution of cocaine before attempting intubation is debatable. It no doubt decreases the reflex irritability of the throat in some cases. In other cases, it appears to be of little value, and I have felt that it sometimes increases the tendency for laryngospasm to occur. It certainly is not a substitute for obtaining an adequate depth of anesthesia before attempting to insert an intratracheal catheter.

I now use a local anesthetic cream to lubricate the endotracheal tubes. It is difficult to say how much good this does toward lessening reflex irritability during the course of the anesthesia, but I feel that it is of some value in preventing irrita-

tion of the vocal cords by the tube as the head is moved.

I have always believed that operations on the vocal cords with direct laryngoscopy constitute one of the most difficult anesthetic problems. The reflexes in the laryngeal region are about the last to be obtunded, and, if satisfactory working conditions are to be provided, the anesthesia must be as deep as for any surgical procedure.

Before the introduction of pentothal sodium and curare, ether was used. To provide sufficient relaxation, large amounts were necessary, even for short operations. Naturally, the period of recovery was long and out of proportion to the time required for the operation, and many patients were sick for several hours after the operation. The routine use of the electrocautery presented definite hazards, even if the ether bottle was removed from the machine before the cautery was used.

Mayo Clinic

THE DIAGNOSIS AND TREATMENT OF CONDITIONS OF EXPOSURE

TRENCH FOOT, IMMERSION FOOT AND FROSTBITE

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THE IMPORTANCE of consideration of the treatment of the conditions resulting from exposure, especially in the armed forces under combat conditions, cannot be overestimated. Official reports, as well as newspaper accounts from the Korean front, indicate that large numbers, often as high as three fifths of a division, have been removed from combat and hospitalized because of trench foot or frostbite injuries. Some of these men were also probably battle casualties but the majority could easily have been due to the conditions of exposure alone since this will incapacitate a man just as surely as a shell fragment. Often the resultant damage is just as great and, in some instances, may be greater than it is after a wound as result of enemy action.

Exposure of the feet for several days to cold damp weather frequently results in a condition known as trench foot. The outside temperature required to cause trench foot is not so low as that required for frostbite, mainly because of contact of the extremity with water. Aside from its local action on the skin, water conveys heat away from the extremity faster than does air, and soon causes vasoconstriction.

Immersion foot results in a condition quite similar to trench foot, but in addition to the injury resulting from the action of low temperature in the water, there is a maceration of the tissues by sea water which sometimes results in infection. There is also some debilitation and even starvation or shock as the result of exposure. Some cases of trench foot may result in soldiers who have been wounded and gone into shock on the battlefield. This often produces a rather severe type of trench foot, or even frostbite.

Frostbite is an injury resulting more rapidly than does trench foot and is mainly due to the exposure of a part at a much lower temperature than is often the case with trench foot. However, the injury is similar and the subsequent course may be exactly the same. High altitude frostbite is rather instantaneous freezing resulting from exposure suddenly to the high altitude temperatures of minus 40 or minus 50 degrees, as a result of enemy action or other mishaps when the extremities are exposed.

The further action of cold in the presence of an increasing anoxia of the tissues and muscles results also in damage to nerves, and the part feels numb and cold at first so that the soldier hesitates to exercise his feet. As soon as the feet begin to get warm after exposure, the toes tingle and either burn or ache. It is in this period of too rapid thawing that much unnecessary damage may occur. Pains may ascend through the foot to the knee with the vasodilation that occurs in the damaged tissues. In patients with capillary damage, there is exudation of serum and tissue fluids, causing sterile inflammatory reaction and blebs, some of which may cover the entire plantar surface of the foot and contain bloody fluid. Any degree of injury may result, varying from coldness and stiffness of the feet for a few days to gangrenous toes and feet with large blisters that require months before normal walking is possible. A few require amputation. One patient was observed with absent or decreased dorsalis pedis artery pulsation in one foot as long as six months after the onset of trench foot.[1] This foot remained cool and moist. In 12 per cent of bodies, "Gray's Anatomy" states, the dorsalis pedis artery is so small that it may be spoken of as absent. In 3 per cent its place may be taken by a large perforating branch of the peroneal artery.

GRADES OF SEVERITY OF TRENCH FOOT

Grade I, Mild.—The feet are cool with numb great toes and slight ache or stiffness, but no discoloration, blebs or swelling, and no decrease of dorsalis pedis and posterior tibial artery pulsation. Back to duty in two weeks.

Grade I.—Cool, sometimes moist feet have slight cyanosis, but no blebs, stiffness or severe pain interfering with sleep. Dorsalis pedis and posterior tibial arteries pulsate normally. There might be mild aches for a time when the feet are too warm. Usually the man is back to duty within six weeks to three months.

Grade II.—Cold, cyanotic feet are moist at times, with decreased or absent dorsalis pedis part of the time; aches at night interfering with sleep for several days and tenderness to pressure over metatarsal pads. Within a week from onset, they may become warm, swollen and tender. Back to duty

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in two to six months, average is four months. Some will be unable to do combat infantry duty.

Grade III.—Cold, mottled, cyanotic feet have large blebs and areas of ecchymosis; pain on motion of toes and pressure over metatarsal pads, with continuous pain and aching in feet day and night, and later desquamation of thick layers of skin. Often there is absent dorsalis pedis and poor posterior tibial pulsations. These pulses may come and go for several days, particularly the dorsalis pedis. After a few days the feet may become warm and swollen with little or no cyanosis and have a bounding dorsalis pedis pulse. Back to duty in six months or longer; many must be on limited duty.

Grade IV.—In addition to the conditions described, patients in this grade have areas of gangrene over toes, black nail beds and marked swelling and pitting edema of the feet. This may result in physiologic amputation of toes. In a surprising number the black dermis peels off gradually, leaving granulation tissue underneath. A few have gangrene with necrosis of the entire toe or foot and require amputation.[1]

COURSE

The feet become purple or cyanotic when dependent and may blanch when elevated, indicating a slow subcutaneous circulation in spite of dilation of arteries in the foot, with increased circulation in deeper tissues. In a few weeks the general swelling and sterile inflammation subside, leaving a foot tender to pressure over the plantar surface of the metatarsophalangeal area with some return of sensation to the toes. The great toe is more affected by numbness, blisters and paresthesia. Ecchymosis and superficial burning may be on all toes, especially at pressure points in contact with the shoes and on the dorsum of the foot and on the heel. The toes remain stiff for weeks or months in moderately severe and severe trench foot. Some patients have flexion deformity of toes which sometimes takes six months or more to straighten out.

The patients who exhibited any tendency to contracture of the toes, or who were unable to move the toes on admission to the hospital, were tested with faradic-galvanic current to determine the state of nerve and muscle function. None was found to have absence of response. In the grade I and II cases, mild ache and tenderness on plantar surfaces of metatarsal arch after walking persist for several months. Most mild cases lose much of the aching after the first week of hikes. These complaints may be prolonged and exaggerated in introspective individuals. The grade III patients may have tenderness on walking for six months or more, and few are able to return to full field duty at all.[1]

DISCUSSION

Davis[2] et al quote Sir Thomas Lewis as stating "If the skin is sufficiently cold, 10 degrees C. (50 degrees F.) or less, the blood will not part with its oxygen." They continue; "If we assume Lewis to be correct, it seems illogical to reduce the temperature of the already damaged tissue below 10 degrees C. to the level of 2 to 5 degrees C. recommended by Greene. The point stressed by him that the metabolic requirements of the tissues are lowered at the temperature he recommends seems of little consequence in comparison to the fundamental fact that no oxygen is released by the blood to the tissues at these temperatures." This makes it possible for cellular damage and destruction to occur at temperatures in the tissues above the critical level of minus 5 to minus 7 degrees C."

In experiments in which the tail of a rat was exposed to cold and wet, Blackwood and Russell[3] found that the muscles and nerves were much the most vulnerable tissues. They were conspicuously damaged after thirty-eight hours' exposure and more severely damaged after longer exposure. The skin and other tissues, including blood vessels, appeared more resistant to chilling. Two months after exposure, the nerves and muscles had not returned to normal, and in rats surviving sixty days some evidence appeared that muscle degeneration secondary to denervation was setting in.

White and Warren[4] believe that the pain in immersion foot subsides only when fibrous tissue ceases to contract. They found no effective treatment once the fibrosis had developed. They believe that artificial cooling of the injured limbs early in the period of recovery should do much to prevent fibrosis and the prolonged incapacity which may follow in its wake from rigidity of the feet and from pain. Their microscopic studies of biopsies revealed an increase in interstitial connective tissues and collagen, which involves the blood vessels, muscle fibers and nerves. Pain of this type tends to clear after six to eight months, the period in which the collagen surrounding the nerves ceases to contract.

Finneran and Schumacher[5] produced experimental frostbite in rats, mice, rabbits and dogs by immersion of extremities in a solution at minus 25 C. for fifteen minutes. Rapid thawing studies by warming the frozen part in water at 42 C. temperature (107 F.) produced better results than the control series which was untreated, or when water at 38 C. (100 F.) or 50 C. (122 F.) was used. In other similar groups in which the frozen extremities were allowed to thaw spontaneously, there was not as good a result. They also found that if anticoagulant treatment was delayed as long as three hours after freezing, the results were not significant. The use of rapid thawing with heparinization combined did not appreciably improve the results in preventing gangrene in frostbite. Those animals treated with tetra ethyl ammonium chloride injections were no better than the untreated ones either, so far as vasodilators were concerned. Finneran and Schumacher commented that apparently no one had succeeded in obtaining the brilliant results that Lange and his associates report

in treatment of frostbite of the rabbit's foot and the use of heparin.

Finneran and Schumacher found the use of heparin less effective than the use of rapid thawing at 42 C. (107 F.). Of thirty-six patients on roniacol tartrate, 100 mg. three to six times daily for four weeks, 24 per cent showed improvement and 55 per cent showed no improvement. Sympathectomy in their animals seemed to have helped some. Thirty-five per cent of the dogs' feet treated by sympathectomy sustained no loss of tissue as compared with 15 per cent in the untreated group. There was an excellent result in 45 per cent of the treated cases as compared with 20 per cent in the untreated group by the use of sympathectomy. It did not improve the results of rapid thawing, however.

A report on a symposium on frostbite by Russian investigators has been reported by Brandstadt.[6] Their thesis is that the more rapidly the frostbitten extremity is warmed, the less necrotic and degenerative symptoms develop in the tissues after warming. By rapid warming, they mean the combined used of warm baths and massage. Brandstadt states that the baths should never be warmer than 37 C. (100 F.) because overheating the tissues is dangerous. They also agree with us that massage should not be given when several hours have elapsed after the occurrence of the frostbite because, after inflammatory symptoms have appeared, the injured tissues are in need of absolute rest. We have not thought it particularly beneficial to give routine injections of calcium chloride in a 10 per cent solution, 5 cc. every ten minutes for three injections; nor have we felt that treating the first degree frostbite cases with 5 per cent tannic acid or other solutions and dyes, or using sunlight exposure was of any particular value, while the Russians apparently do. Sunlight is beneficial if epidermophytosis is a complication. They remark that freezing of tissue does not occur until after death and that the decisive factor in frostbite is the period of time in which the low tissue temperatures act; which, of course, is not the case in high altitude frostbite in which immediate freezing of a part may result if exposed at a minus 40 C. temperature. Therefore, not all of these cases should be treated the same as the ordinary cases of frostbite or trench foot.

Another study concerning the transfer and effect on personnel of unusually cold weather and exposure has been made by the U. S. armed forces at the U. S. Medical Nutritional Laboratories, Chicago, Ill.[7] Complete studies on fluid balance, certain chemical changes in the blood and detailed analysis of the nutritional aspect of these men under different conditions was studied carefully and completely.

TREATMENT

General Treatment.—The first principle in the treatment of trench foot is to have the patient rest in a cool place, keeping the body comfortable, warm and clean. The feet should be washed daily with soapy water at 70 F. and dried gently, and the surface of the feet may be cooled with air currents from a fan or by exposing them to room temperature not exceeding 70 F.—preferably 60 degrees. This and absolute bed rest promote vasoconstriction and decrease local metabolic requirements. The body should be warm with enough blankets to make the patient comfortable. If the patients are seen immediately after damage, before swelling has occurred, warming in air or water at body temperature may be of value; after swelling is present, warming may do more harm than good.

Some grade I mild, and grade I patients are permitted to walk to the latrine and to mess immediately. As soon as the acute pain has subsided, within a week in grade I and II, the patient is started on passive vascular exercises. He elevates his feet at an angle of 45 degrees on a board or chair in his bed for two minutes, then rests them horizontally for five minutes, then sits with legs over the edge of the bed and dangles for two, and later three minutes, followed by resumption of the horizontal state. This is repeated three or four times daily during the next week or two while the patient is at bed rest. This, plus calisthenics in bed every morning, conducted by the ward master, helps keep these patients in good physical condition. Cool water soaks and whirlpool baths at 70 F. for from twenty to thirty minutes daily helped temporarily; whether or not they shorten the period of recovery was not established. Those with warm, swollen feet could not tolerate the cold water. Cooling the feet at bedtime would enable many patients to sleep without sedatives or analgesics. Some patients respond to applications of cold, even ice bags, with relief of pain. In this connection, from 150 cc. to 300 cc. of 5 per cent saline solution intravenously daily often gave immediate symptomatic relief from aches and pains in the later stages of trench foot. It is not to be used routinely since it did not relieve aches and pains that were present on walking. Permanent relief was obtained after four to seven days treatment in some cases, although no consistent effect on swelling was noted. In many cases the decrease in swelling was more rapid than usual, however. This treatment was used effectively in nineteen patients who previously had had no relief from codeine sulfate 0.03 gm. and aspirin 0.6 gm. Two patients who were unable to walk because of painful swollen feet were not relieved. Fifty per cent glucose in 50 cc. doses and normal physiologic saline solution intravenously were given in an attempt to relieve symptoms in patients with cold and non-swollen feet without success. Nicotinic acid, 50 mg. and thiamine chloride 50 mg. three times daily were tried on six patients for a week without relief of symptoms.

Laboratory data were not revealing. Red and white blood cell counts and urinalysis were normal in uncomplicated cases. Two of six patients on whom x-rays of the feet were made showed

some evidence of demineralization that could be explained by the preceding period of inactivity. Blood nonprotein nitrogen was normal in three grade IV cases in which it was obtained.[1]

It seems reasonable that rapid thawing may be of some advantage in early cases as Loyal Davis has mentioned in high altitude frostbite studies. In mild cases, before any permanent damage or gangrene or peeling or inflammatory reaction has set in, the temperature of the extremity might be brought to normal and no permanent effects will ensue. Although the fingers may throb and ache for hours, there will be no blistering or gangrene. However, this cannot be done in the more severe cases in which the exposure to cold has been prolonged and permanent damage to the tissues has resulted. This is especially true if these patients are not seen until six hours or more after the initial injury. In two or three days the skin become dry, wrinkled and hard and has the appearance of gangrene. Rapid warming at 37 or 42 C. (98 to 108 F.) as advocated by some in experimental studies would do damage to these patients. Therefore, if one sees patients with trench foot of grade IV degree, or any disease of exposure of this degree, after the inflammatory stage has been reached, there would be no advantage to rapid thawing at body temperature or slightly above and, in fact, one could add to the damage and the subsequent disability by so doing. This should be kept in mind by everyone treating these patients.

Hyperhidrosis is a complication in trench foot. It may cause maceration of the skin, particularly by undermining it about the heel and toes. This is a good medium for fungus infection, which is difficult to eradicate. Potassium permanganate water soaks, 1:5000 solution, and 10 per cent formalin are of value, but one must not attack the fungus too vigorously. Patients with this condition, on whom sympathectomy was done on one side, improved remarkably in that foot but not in the other foot. Perhaps banthine and other blocking agents will prove useful in hyperhidrosis.

Anticoagulants.—One should remember that the results quoted by various authors with the experimental use of anticoagulants cannot be transmitted directly to the treatment of trench foot and frostbite injuries in combat soldiers. Some studies made experimentally were done with rapid freezing for ten to fifteen miuntes, and the frozen part could be immersed in water at 42 C. or body temperature immediately afterwards. Also, there was no other prolonged exposure or injury such as would develop by prolonged exposure of soldiers developing trench foot. While anticoagulants may be of value in these experimental cases and in certain trench foot patients, it would not be of value if several hours or two or three days had elapsed before the soldier with trench foot is seen in an installation where definitive treatment could be given. Therefore, rapid thawing as a treatment is rather limited to the battle area or clearing stations and should not be used if the patient is not seen until several hours after the occurrence of the trench foot injury.

The use of heparin with other anticoagulants in these experimental cases cannot be transmitted directly to use in soldiers in combat areas who have trench foot or frostbite, even if it be given soon after the injury had occurred, by the battalion surgeon. There would still be the danger of a previous battle wound, or the fact that a wound might occur as result of combat, and which could hemorrhage because of concurrent use of anticoagulants. Similarly, anticoagulants could not be used as a preventive measure for these soldiers in areas most likely to develop trench foot. Thus, what might be of some value experimentally, or of slight value in civilian cases of trench foot or frostbite, would not be of value to soldiers in combat areas who had the same type condition because he is exposed to wounds by shell fire or already has other types of lacerations or injuries. If the patient can be given heparin in a clearing station or hospital within a few hours of his trench foot or frostbite injury, it might be of some value.

In a recent report on the use of vasodilator drugs in chronic trench foot, Reddish and Brandman[8] considered that priscoline was effective only if given parenterally, and that nicotinic alcohol tartrate or roniacol tartrate was effective by mouth.

Sympathectomy.—Eleven patients with grade III and two with grade IV trench foot, who were carefully selected by our consultants with the aid of consultants in the Surgeon's Office in the Mediterranean Theater in 1944, were subjected to lumbar sympathectomy, unilateral, in an attempt to relieve the constant pain and prolonged tenderness of their trench feet which had persisted for several months after the initial exposure.[1] No great relief had occurred after lumbar sympathetic novocain block on other patients, and only slight relief had resulted after such a procedure on these selected patients. Two months after the unilateral excision of the second and third lumbar sympathetic ganglia, the results were good in those with gangrene of the toes. The procedure was done on the side with the most involved extremity. While the hyperhidrosis and the epidermophytosis as well as some cases of gangrene were relieved in most of the patients, it is certainly not to be recommended without careful study. It will not benefit all of the patients. Sympathectomy is indicated only in cases in which there is some objective evidence of circulatory insufficiency, or in which Reynaud's phenomenon persists months or years after the acute phase of the disease and which can be shown to be relieved by test sympathetic blocks, using 1 per cent novocain hydrochloride. At times when acute cases of trench foot or frostbite have intractable edema and pain not relieved by ordinary measures, sympathetic block may be tried even though it might not be of value in every case.

REHABILITATION

In the course of treatment of trench foot in the 21st General Hospital in Italy in 1944, lectures were given on the proper care of the feet.[1] Undue exposure when not absolutely necessary was stressed. As soon as they were able, the patients were out of bed a part of each day. From two to seven days later, depending on the severity of the condition, they were allowed to go to the mess hall outside the ward. It is important to realize that some of these patients have aches and pains in the muscles and metatarsophalangeal joints on walking for several weeks after the feet appear normal. After they cease to have pain during ordinary walking, many overcome slight aches after hikes by persisting in walking even though the feet ache for the first few days. Occupational therapy, reading, writing, games and entertainment for bed patients and out door exercises for the ambulatory are essential. When they are safely ambulatory, their attendance is required at daily organized hikes, which are gradually increased in length compatible with the patient's condition. As soon as they are able to walk three to five miles without undue trouble, they are ready for duty. If after three months they show persistent swelling of the feet, persistent pain, cyanosis or hyperhidrosis after such marches, although such things are not present after one mile hikes, they are not ready for duty and will not be for some time to come. Those unable to march ten miles will not do infantry combat duty, but could do combat artillery, or ordnance duty.

The establishment of a conditioning and rehabilitation section in the hospital aided in the improvement of these cases. In this section they are up for formation each morning, take calisthenics, stand retreat and have supervised lectures on current events, orientation and combat problems. Some have daily hikes and drill. Others work in the hospital as ward men, help in the post office, the message center, the Red Cross, or as clerks, mechanics or telephone operators during their convalesence. With the establishment of temporary limited duty, many of the patients are discharged to a reception center on a limited duty status for as long as six weeks, then sent to limited duty or full duty. This allowed more of them to remain in the theater until ready for duty. Some could do class B or permanent limited duty who could not stand up on long marches in all kinds of weather and terrain.

DISPOSITION OF TRENCH FOOT CASES

The following table shows disposition of trench foot patients at the 21st General Hospital in Italy in 1944.

The average number of days at bed rest per patient was ten days. An average of twenty-four days elapsed before long walks outside the area were attempted. During this time the patients were up to the latrine, were up and around in the ward and went to the mess hall for meals, a distance of one quarter mile. The average number of hospital days for all grades was sixty days. All patients went through a rehabilitation period of daily hikes before returning to duty.

TABLE I

	Number	Per Cent	Average hosp. days
Temporary limited duty	12	3.4	67
Permanent limited duty	24	6.8	60
Full duty	292	83.3	45.5
Zone of the interior	23	6.5	70
Totals	351	100	60.6

READMISSIONS

Fourteen of the 330 patients treated in the 21st General Hospital in Italy in 1944 who were sent to some sort of duty in the theater overseas were later readmitted to this and other hospitals in the area.[1] Four of these eventually were returned to full duty and eight were placed on limited duty. Two on temporary limited duty were returned to the United States after failing to do such duty. Twenty-eight patients with previous hospitalizations for trench foot at other hospitals were admitted to the 21st General Hospital in Italy during the month of June 1944 because of recurrent or continued symptoms of trench foot. All of these readmissions were precipitated by hikes of from two to three miles. Maceration of the skin and epidermophytosis had occurred in 25 per cent. It was the third admission for one; the fourth for another. Some of these men had had no period of rehabilitation. Four others had been referred as trench foot cases but proved to be cases of epidermophytosis with no previous signs or symptoms of trench foot. One has, occasionally, to differentiate between symptoms of trench foot and those of other types of foot trouble under the guise of trench foot. It is extremely difficult to tell sometimes, objectively, whether a patient has had a mild trench foot six months previously or not. It is quite possible, in some instances, to get rather vague, prolonged symptoms and aches after long marches in men who have had mild trench foot with recovery several months previously.

PREVENTION

Under this heading one may say that soldiers in combat cannot always change their socks daily and remain warm and dry. Since this is true, trench foot and frostbite will continue to occur so long as aircraft are damaged and men are exposed to high altitude temperatures for even brief periods, such as when they take off a glove to repair a gun or adjust a part. Or, they may have immersion foot in an emergency landing in the sea or when troops or navy personnel are subjected to exposure to cold water as result of combat activity. The incidence can be lowered, however, if the

following principles are followed as well as possible under the circumstances.

1. Daily cleansing of the feet. If water is not available, wring out the socks and then massage the feet gently. This includes proper instruction in the prevention and treatment of epidermophytosis.

2. Proper fitting of shoes, which have been broken in before attempting long marches. For wet winter climates, wear one half to one and one half size larger than usual, with heavy woolen socks. Some form of insulating material in the boot would help. If no heavy socks are available, two pairs of winter issue may be worn. The troops should have shoes or boots for winter service that are as nearly waterproof as possible and yet be light enough for marching. None of the clothing should constrict circulation. The use of shoe packs (leather boots with a lower rubber covering) with the removable felt innersole lining have certain disadvantages; the feet sweat, then the sweat may freeze and cause trench foot or frostbite. It has been reported more recently that a complete rubber boot with rubber inside and out, separated by an airtight enclosure, filled with wool lining for insulation is available. A suitable interlining helps to keep the foot warm and, even if water or snow enters the boot, it will rise to body temperature within a half hour or so since the boot is insulated from the outside temperature and there is less danger of sweating and freezing. This should be a decided advantage so far as trench foot and frostbite are concerned.

3. Change socks as often as possible. In damp weather change them daily, washing one pair and drying it inside the jacket with body warmth if necessary. Each man in combat should reciprocate with his buddy in massaging each other's feet and lower legs as often as possible.

4. A supply of clean socks is a command function. They should be supplied with the rations daily or every other day to front line troops when situated under conditions where they cannot wash their socks.

5. Commanding officers should see that troops are active on their feet at regular intervals each day. When they are pinned down on wet ground by enemy fire for days, it is necessary to relieve them often enough to prevent irreparable damage if at all possible. Most of these men develop trench foot with only five to seven days' exposure.

Trench foot, immersion foot and high altitude frostbite resulting from inactivity during exposure to cold damp weather are a serious problem. The men should be examined by a doctor who has had experience with this problem. Those with definite trench foot, grade I, mild, may be treated in a rest area. Some men need neuropsychiatric care most of all. The bulk of psychiatric patients who do not have trench foot, and those who have it, but whose major problem is psychiatric can be treated earlier there, before fixation on the trench foot has occurred, if a consulting psychiatrist is employed in the forward hospitals and clearing stations to help sort patients efficiently, as was done with psychoneuroses in World War II in the Mediterranean and European theaters. A few of these need only strong reassurance and return to duty. Patients of grades I, II, III and IV should all be hospitalized where proper treatment can be carried out. The total number of cases hospitalized for diseases of exposure alone represents a great loss of man hours and a permanent loss of some of the trained, experienced men in combat and service organizations. The preceding table shows the disposition of 351 patients treated in the 21st General Hospital in Italy during 1944. An average of sixty days in the hospital was required. Thus, 21,270 man days were lost because of trench foot and its complications, not counting days lost by some patients who were readmitted to hospitals in North Africa and the zone of the interior. These figures could be multipled by many other hospitals where the same situation existed in World War II, and subsequently in more recent conflicts. The overall figures throughout the entire United States army would be tremendous.

Although the treatment of trench foot injuries and other injuries of exposure may be classified, this treatment classification cannot be used rigidly in every instance since the injuries and the results of the injuries vary to some extent in each patient, or from one foot to the other, in some cases. This classification, however, is an advantage in teaching medical officers so that they will be better able to care for these patients correctly, thus resulting in greater conservation of the tissue and a more rapid return to normal, or near normal activity. It would be of inestimable advantage if a medical officer who has had experience in this field and who could recognize and classify these patients correctly could be attached to each hospital installation. Other officers could be taught to treat these cases once they were properly diagnosed and classified.

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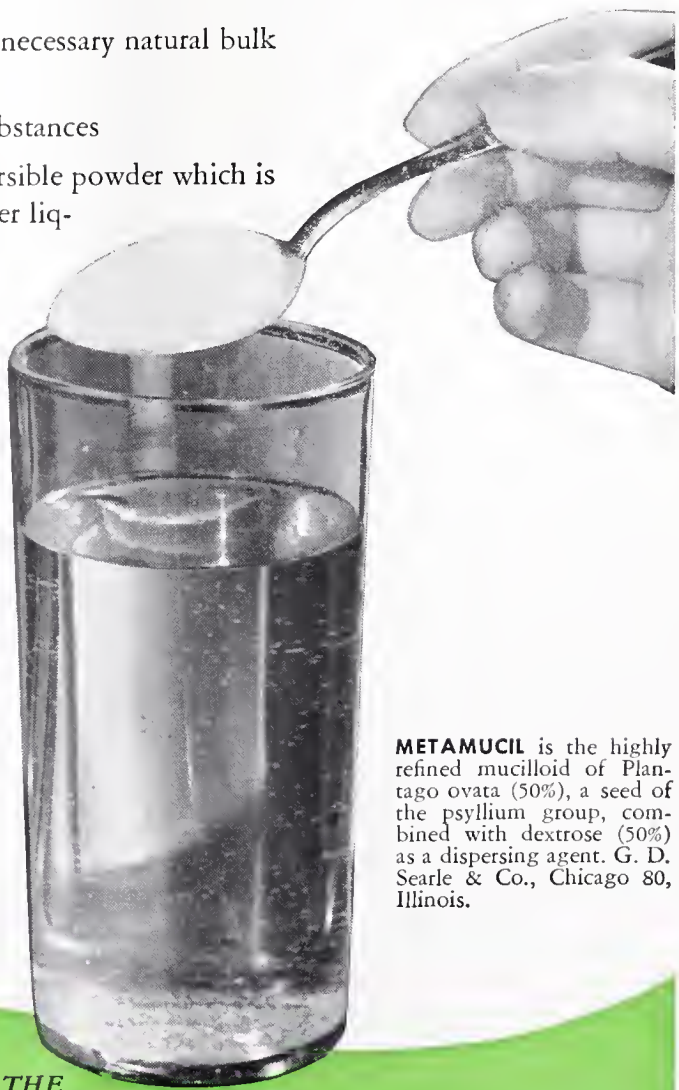
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580M

Postgraduate Review

ECTOPIC PREGNANCY

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In 1947 we[1] presented data concerning the cases of ectopic pregnancy, excluding the abdominal variety, managed at the Charity Hospital of Louisiana at New Orleans from January 1, 1906, through December 31, 1946, at which time the figure had exceeded the thousand mark. At that time it was stated, "during the twentieth century the literature on this subject has become voluminous, but few articles present a series of more than three hundred cases from a single institution."

From January 1, 1947, through December 31, 1950, 320 such cases have been treated at Charity Hospital. During this time there have been 40,448 deliveries, including stillborns, giving an incidence of one to 126, or a percentage of 0.79 (table I). It is logical to believe that sulfonamides, penicillin and the other antibacterial agents have influenced the incidence of tubal gestation. In days gone by tubal infection was responsible for many cases of sterility, whereas, in the modern era medication has become available with the result that complete occlusion of the salpinges occurs with much less frequency than was formerly the case. Although fertility is maintained in such instances, it is our belief that the progress of the fertilized ovum is impeded by either tubal adhesions and decreased salpingian peristalsis or both. In making certain comparisons between the cases managed for the first forty-one years and the last four years, it becomes apparent that the incidence is still higher in the non-Caucasian race. This is explained on the basis that tubal infections are more common in the Negro. Time has not appreciably altered the age range. Most of the cases in white patients are encountered in the 26 through 35 year group, whereas the Negro cases fall most frequently in the 21 through 30 year range. This is indicative of the fact that members of the Negro race become candidates for gestation at an earlier age than do white persons. As in the previous series, the vast majority of the patients has been previously pregnant. Furthermore, the incidence of previous proved eccyesis is essentially the same (approximately 3 per cent). The first study revealed that the right tube was definitely the site of predilection but the current one showed almost an equal occurrence on the two sides.

From the Department of Obstetrics and Gynecology, Tulane University School of Medicine and the Charity Hospital of Louisiana at New Orleans.

Presented at the 93rd Annual Session of the Missouri State Medical Association, Kansas City, April 23, 1951.

DIAGNOSIS

Although the history in a given case of ectopic pregnancy may be so typical that a diagnosis can be made via telephone, there are many cases which give a confusing history and present signs and symptoms quite variable in character. Ectopic pregnancy frequently masquerades and it may mimic not only many of the diseases affecting the lower abdominal organs but occasionally those involving the upper abdominal structures and, in rare cases, even chest conditions. In this connection we do not wish to minimize the necessity of careful history taking but we wish to emphasize the fact that the history in a given case may be quite atypical. Certainly it is wise to consider the possibility of oviductal gestation in females within the childbearing age who complain of disturbances in cyclic bleeding and especially if there has been pain in the abdomen. In taking the history one must not be misled by the story that a midwife has been recently visited. To conclude that the patient has had an abortion may be erroneous. Likewise, information that a fetus has been passed is not invariably correct.

TABLE 1. *Incidence Ratio of Eccyesis to Cyesis at New Orleans Charity Hospital*

Year	Ectopics	Deliveries	Ratio	Per cent
1947	53	9,108	1:172	.58
1948	72	9,763	1:136	.74
1949	91	10,573	1:116	.85
1950	104	11,004	1:166	.95
Total	320	40,448	1:126	.79

It becomes quite obvious, then, that in many cases of ectopic pregnancy an accurate diagnosis cannot be made on the basis of the history. The rule is to examine all cases carefully. The breast findings are usually not significant. The vulva is inspected carefully. The cervix is visualized. If there are blood clots in the vagina, these are removed and a careful search made for fragments of decidua or secundines. In some cases one will be required to differentiate ectopic pregnancy from threatening abortion or incomplete abortion. If one finds products of pregnancy in the vagina or at the external cervical os, the diagnosis is obvious, but one should remember that combined pregnancy does infrequently occur. The presence of decidual tissue without chorionic villi, or even the passage of an intact decidual cast, does not in itself indicate ectopic pregnancy. The marked variations in the endometrial pattern in cases of ectopic pregnancy are such as to make endometrial biopsy often unreliable. Romney,

Hertig and Reid[2] have recently demonstrated that only 19 per cent of endometria associated with ectopic gestation show decidual reaction. We perform uterine curettage only in cases in which we are reasonably sure an incomplete abortion has occurred. As has been pointed out often, motion of the cervix in a case of ectopic pregnancy produces pain as a rule. This pain may be so great that in many cases the patient will not relax sufficiently for one to outline the uterus with certainty, but in most cases the corpus uteri can be palpated. It is important then to palpate the adnexal regions. In some cases a mass compatible with tubal gestation will be found; in others one will be required to differentiate between hydrosalpinx, ovarian cyst, endometriosis, old pelvic inflammatory disease or uterine myomas. At this stage of the examination one must decide the next step to be taken. Although the correct answer in many cases will be culdocentesis, we shall defer a discussion of that important diagnostic procedure for the moment, assuming that the patient is in good condition with a normal pulse rate and blood pressure and without gross evidences of anemia. Certainly all patients are entitled to complete blood pictures and urinalyses. The former is seldom of value in making a diagnosis in the atypical ectopic pregnancy case. There may be great variations in the erythrocyte count, the leukocyte count, the hemoglobin and the hematocrit. In many instances they will be borderline in character. Even a rapid erythrocyte sedimentation rate does not rule out eccyesis. As in all cases suspected of pregnancy or pregnancy complications the sooner the patient's blood group and Rh type are known the better, and if there is even a reasonable suspicion that ectopic pregnancy does exist compatible Rh suitable blood should be available. If one wishes he may draw blood or obtain a specimen of urine for a pregnancy test using frogs or some other animal. Because of its rapidity, a frog test is preferred by many. However, in the diagnosis of ectopic pregnancy biologic tests for pregnancy are not very valuable. A positive test simply indicates that living chorionic villi are in active contact with the maternal blood stream. This certainly does not tell where the living chorionic villi are situated. Furthermore, a negative test does not rule out the possibility of tubal gestation. At this stage the examiner must decide as to whether an investigation of the contents of the cul-de-sac of Douglas is indicated or whether it is desirable to observe the patient with a tentative diagnosis of "possible ectopic pregnancy." If he is attempting to decide whether the patient has an intra-uterine or an extra-uterine pregnancy, the latter course will probably be pursued if the patient's condition is good. In suitable cases, in the hands of an expert culdoscopist, that procedure might be elected. Furthermore, there are those who might subject the patient to a posterior colpotomy with exploration of the cul-de-sac. Actually we advocate a procedure which is much simpler than either of these two procedures.

Culdocentesis[3] can be performed in the office, the clinic, the admitting room or in an examining room at the hospital. Although we have administered analgesics to some patients, even that is not absolutely necessary. Properly performed it carries no danger and the information obtained is of inestimable value. The patient's urinary bladder is emptied by micturition or preferably catheterization. With the patient in the customary position for vagino-abdominal examination a speculum is inserted to permit adequate visualization of the cervix and posterior vaginal fornix. Zephiran or merthiolate solution is applied after the vaginal and cervical secretion has been removed by means of sponges. The posterior lip of the cervix is grasped with a tenaculum and elevating traction applied. A sponge-laden forceps is used to apply additional zephiran or merthiolate solution. A number 18 spinal needle is quickly introduced into the cul-de-sac, the direction of the needle being parallel to the corpus uteri and the depth of the introduction not exceeding 2 cm. Suction instituted by means of an aspirating syringe (fig. 1).

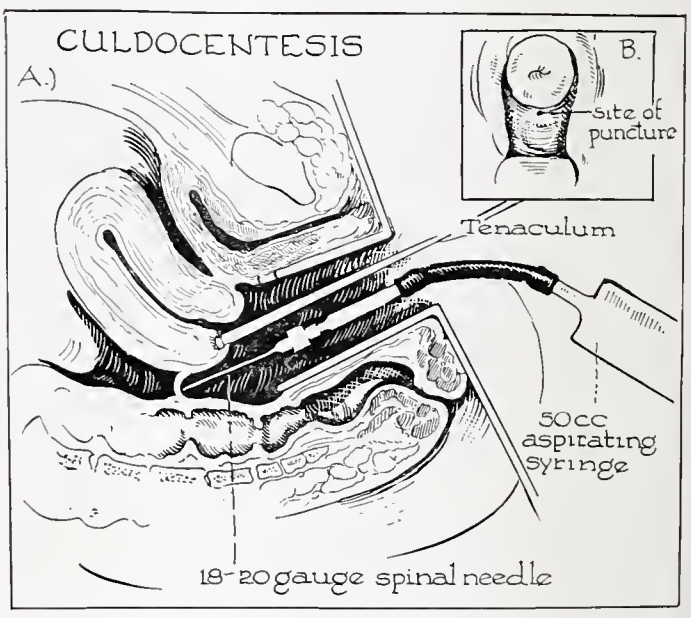


Fig. 1. Culdocentesis.

This is usually accomplished before the elapse of 60 seconds to avoid the possibility of the clotting of intravascular blood, which may have been inadvertently obtained. In this connection the likelihood of laceration of blood vessels or of a viscus is minimized by keeping the needle in one plane and not permitting it to "wander."

The aspirated material is examined for gross characteristics. If no fluid is obtained, another puncture is indicated inasmuch as the absence of fluid usually means faulty technic. Clear or faintly cloudy fluid is usually from the peritoneal cavity although it might come from an adnexal cyst. Pinkish or blood tinged fluid may be indica-

tive of salpingo-oophritis, consequently, microscopic study is indicated. When frank pus is obtained, one is obviously dealing with an abscess or peritonitis. If blood is aspirated, it is important to note its ability to clot. If fragments of old blood are aspirated, the diagnosis is equally as positive as if blood which will not clot is aspirated. Blood from an artery or vein will clot within a few minutes whereas that from a hemoperitoneum will not clot. The period of observation should be at least six minutes, otherwise one may draw erroneous conclusions. It is agreed that next to being "ectopic pregnancy minded" culdocentesis has been the most important factor in the diagnosis of ectopic gestation at the Charity Hospital. Figure 2 depicts the increase of accuracy in diagnosis

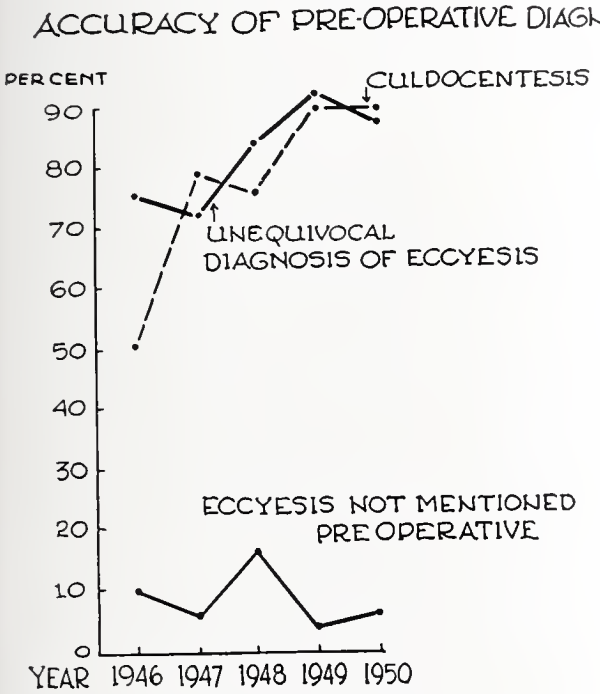


Fig. 2. Accuracy of preoperative diagnosis.

resultant from the increased utilization of this procedure. In 1946 an unequivocal preoperative diagnosis was made and substantiated in 70 per cent of the ectopic pregnancy cases while in 1950 89 per cent of the cases had such a diagnosis. The chief reason was that 89 per cent of the cases in the last year were given benefit of culdocentesis whereas only 70 per cent of the cases in 1946 were so treated. As a result of increasing the accuracy of the diagnosis the mortality rate has been lowered and the preoperative and postoperative hospital stay shortened.

THERAPY

It is our firm belief that ectopic gestation should be treated surgically as soon as the diagnosis is made. Inasmuch as approximately 15 per cent of the patients in the ectopic pregnancy category admitted to Charity Hospital arrive in a state of shock, or develop shock soon thereafter, the question naturally arises as to whether the patient should be treated for shock before given the benefit of operation. Our reply is that the shock should be combatted but operation should be performed immediately. The rule is to introduce a 17 gauge needle into one of the patient's veins and begin the administration of fluid. Happy will be the day when every person's blood type and Rh Hr status is known, but until that time one must not delay surgery if dealing with a patient showing signs of active hemorrhage. Surely compatible Rh suitable blood should be made available as soon as possible but in the meantime if the patient is bleeding she must be laparotomized in order to ligate the bleeding site or sites. Of the ninety-six cases in this total series who expired, twenty-five are known to have died of hemorrhage and shock without operation. Prior to the establishment of the blood bank at Charity Hospital the mortality rate exceeded 11 per cent and from 1920 to 1937 during which time 445 cases of eccyesis were admitted, less than one third received a transfusion.[4] From 1937 to 1945, 305 cases were admitted and approximately two thirds were transfused. The mortality rate decreased to 3.3 per cent. From January 1, 1945, to January 1, 1948, 131 cases were treated, 86 per cent received transfusion and the mortality rate was lowered to 1.3 per cent.[5] It is obvious that this decrease in mortality was not entirely due to the availability and usage of compatible blood; however, the role that it did play is important. Concerning transfusions, several points are worthy of emphasis. First, the rate of administration and the amount given is individualized in each case. If the patient is in shock, blood is given rapidly. If the blood pressure rises to normal, the rate is adjusted accordingly. Secondly, one must remember that blood is being used to treat shock and for replacement, otherwise a patient who has a chronic anemia may be literally drowned. Thirdly, some of the patients do not require any blood and to these we do not give a transfusion. Lastly, even before the days of the blood bank we did not advocate autotransfusions. In days gone by we have used gum acacia and later plasma. Today we prefer blood if such is indicated, otherwise an infusion of 5 per cent dextrose in water is given just before, during and immediately after the operation. In cases in which the blood pressure and pulse are depressed and elevated, respectively, oxygen is administered until these two readings are stabilized. Oxygen proves immediately lifesaving in many cases and it may aid in preventing necrosis in the pituitary or adrenal glands.

ANESTHESIA

Table 2 presents a comparison of the anesthetic agents employed in the periods 1937-1946 and 1947-1950. In the latter, cyclopropane has been used in 181 cases, almost twice as many as in the former group. Because of its potency and the fact that a false sense of security may result from a rise in the blood pressure due to increase in carbon dioxide we have great respect for this gas. Having seen patients experience a marked fall in

blood pressure following the discontinuance of such an anesthetic agent and accrediting a death in 1950 to it, we do not recommend its routine use. Certainly ethylene or ethylene and ether are much safer. Ether following a gas induction has proved suitable in a goodly number of cases. In cases of ruptured tubal pregnancy, spinal analgesia should be avoided. Of the eighteen cases handled under this type of agent, eleven cases had estopic pregnancy associated with large myomas and in six of these undiagnosed unruptured tubal gestations were found. Given a case who is in good condition and without hemoperitoneum, intrathecal analgesia is apt to be the one of choice.

TABLE 2. *Anesthetic Agents*

	1937-1946	1947-1950
Cyclopropane	96	181
Ether (Gas Induction)	184	95
Intrathecal	69	18
Ethylene	24	23
Cases	373	317

SURGICAL PROCEDURES

As already indicated the purpose of surgery in eccyesis is to control hemorrhage. This is best done by simple removal of the involved salpinx in most cases. In some instances removal of the ovary on the involved side will be indicated. Table 3 reveals that of the cases operated upon in the 1937-1946 period 303 of the 373 operative cases had a unilateral salpingectomy or salpingo-oophorectomy. Before subjecting the patient to additional surgery the operator must evaluate the seriousness of the incidental pathologic condition, the condition of the patient, the quality of anesthesia, the availability of compatible Rh Hr suitable blood and the gravity of the contemplated procedure. The overwhelming majority of the hysterectomies were done because of uterine myomas; however, a few were necessary because of cornual or interstitial ruptured pregnancies. The rule on our service is to perform a total hysterectomy if a hysterectomy is definitely indicated and the patient's condition will permit. The four cases hysterectomized vaginally in the 1937-1946 period and the last one done in the 1947-1950 group were all cases of unsuspected tubal pregnancy. These cases emphasize the absolute necessity for careful inspection and palpation of the salpinges when the peritoneal cavity is opened for the purpose of removing a uterus via vaginam. The rule on the service is to leave the appendix in place in cases having hemoperitoneum unless it is found to be acutely inflammed. In recent years more of the patients have given histories of previous appendectomies.

TABLE 3. *Surgical Procedures*

	1937-1946	1947-1950
Unilateral Salpingectomy	133	137
Bilateral Salpingectomy	12	2
Salpingo-oophorectomy	170	178
Hysterectomy		
Supracervical	46	18
Abdominal Total	13	13
Vaginal	4	1
Appendectomy	41	3
Other Abdominal Operations	14	5
Nonoperative Cases	8	3

POSTOPERATIVE MANAGEMENT

As already pointed out, culdocentesis and prompt operation have shortened the preoperative stay. Likewise the administration of blood, oxygen, antibacterial agents and intestinal decompression as indicated have done much to hasten the postoperative recovery of the patients. We have learned by experience that the institution of Wangensteen suction for from forty-eight to seventy-two hours in cases having large amounts of blood in the abdomen pays dividends. These patients are candidates for postoperative adynamic ileus even though the operation was performed with dexterity and speed. If the patient has fever or develops it postoperatively, antibacterial agents are administered. As stated, blood transfusions are given as indicated and at a rate as governed by the individual case. Vitamins and in some cases proteins are administered parenterally until the patient can ingest food. Daily examinations for evidence of atelectasis, ileus, peritonitis, pneumonia, wound infection, phlebothrombosis and thrombophlebitis are conducted and if a complication is discovered prompt therapy is instituted. Early ambulation has been encouraged. All of these have been factors in reducing the postoperative stay.

MORTALITY

From 1919 through 1936 a total of fifty-one patients expired. Twelve of these patients were not operated upon, five expired on the operating table and thirty-four died postoperatively. The uncorrected mortality for that period was 11.4 per cent. From January 1, 1937, through December 31, 1950, there have been eighteen deaths giving an uncorrected mortality of 2.6 per cent. Eleven of these cases were nonoperative but seven of them expired in the admitting room. Of the seven postoperative deaths three (two of shock and one of suffocation) died shortly after operation. Intestinal obstruction, pulmonary embolism, peritonitis and pneumonia each claimed a case. Undoubtedly the improvement in the physical facilities of the hospital with establishment of a residency system July 1, 1937, have been important factors in reducing the mortality. Due credit must be given to the staffs of the Louisiana State University and Tulane University Schools of Medicine who supervise 80 per cent of the gynecologic beds at Charity Hospital. In 1941 a department of anesthesia under the direction of an outstanding anesthetist as the fulltime head of the section was instituted. In 1943 residencies in anesthesia were begun. In June 1944 the blood bank came into existence. The steady increase in the use of culdocentesis and the availability of sulfonamides and

antibiotics have played a large part in decreasing the mortality in the last several years. From January 1, 1947, through December 31, 1950, there have been seven deaths. Four patients were admitted in extremis. Three of these patients died in the admitting room within twenty minutes following the time they were brought to the hospital. Of the four remaining fatalities, one died of postoperative pneumonia and another of postoperative shock (in 1947). Pulmonary embolism on the fifth day claimed the life of one patient. Her legs had been examined twice each day and an examination one hour prior to death failed to disclose any symtoms of intravascular clotting. Phlebothrombosis of the right hypogastric vein was proved by autopsy. The last death occurred in a patient whose airway was removed just as soon as the patient had been returned to the ward from the operating room. Ten minutes later the ward nurse discovered that the patient was dead and autopsy confirmed the clinical impression of suffocation. This case emphasized the necessity for postoperative recovery wards under the close supervision of nurses who have been especially trained in the care of postanesthetic critically ill patients. It is the plan to have a sufficient number of such wards to accommodate all cases operated upon at Charity Hospital. After the patient has fully recovered from anesthesia and the immediate effects of surgery, they will be returned to their respective wards. The results which have been obtained in the management of ectopic pregnancy cases at Charity Hospital reflect credit upon members of the resident staff. They are the ones who see the patients at the time of admittance and in the vast majority of instances they have been the ones who have managed the cases.

CONCLUSIONS

1. Because of the increasing number of cases of ectopic pregnancy being admitted to the New Orleans Charity Hospital the condition continues to be one of great importance.

2. The present incidence of ectopic gestation may be due to the effect of antibacterial agents, including sulfonamides, in maintaining fertility in cases of tubal infection that formerly would have become sterile due to complete tubal occlusion. In these cases impairment of tubal peristalsis or the presence of adhesions may enhance the possibilities of implantation in the endosalpinx.

3. Ectopic gestation often presents a classical picture but in many instances its manifestations are so protean that one must be quite "ectopic pregnancy minded" or else the diagnosis will be missed.

4. In all cases in which there is the least suspicion that ectopic gestation may exist, immediate provision should be made for the availability of Rh suitable compatible blood.

5. Laboratory tests, including biologic tests for pregnancy, have been of little aid in making a diagnosis of eccyesis.

6. Culdocentesis has proved to be a valuable diagnostic procedure at Charity Hospital.

7. Once the diagnosis has been made, operation should be performed without delay.

8. In cases presenting evidences of active blood loss, blood should be replaced but operation should not be deferred while blood matching, grouping and Rh typing are done.

9. In ruptured eccyesis, general anesthesia is preferable.

10. The reasons for the decrease in the mortality rate in ectopic pregnancy at Charity Hospital are several fold but the most important are: the establishment of a residency system, institution of a blood bank and anesthesia department, the continued increase in the employment of culdocentesis and modern facilities.

11. A state of "ectopic pregnancy mindedness" with the employment of culdocentesis, prompt surgery, the proper administration of blood, and the use of oxygen, intestinal decompression, parenteral fluids and antibacterial agents as indicated increase the accuracy of diagnosis and decrease the morbidity, thereby shortening the preoperative and postoperative hospital stay.

210 Baronne Street.

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INFANTS ARE BIG BENEFICIARIES OF ADVANCES IN MEDICAL SCIENCE

Newborn babies and infants under 1 year of age have been among those to benefit most from advances in medical science and the efforts of public health agencies during the first half of the century, according to Matthew Taback, A.M., director of the bureau of biostatistics, Baltimore City Health Department.

Mr. Taback, writing in the July 7 *Journal of the American Medical Association,* said that approximately twenty babies out of every hundred delivered alive in Baltimore in 1900 failed to reach their first birthday. A review of present day records indicates that the mortality rate has decreased at an "unbelievable rate" and now stands at about three infant deaths per hundred live births, a decline of 85 per cent since 1900, he added.

Commenting on the death rate of fifty years ago, he said:

"The loss of human life and wasted pregnancy occasioned by the existence of such a high infant mortality rate are difficult to comprehend. Principal causes of infant deaths in 1900 were diarrhea, pneumonia, acute communicable diseases, prematurity and congenital malformations."

The principal causes of infant deaths today, he said, are prematurity, congenital malformations and birth injury.

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Case 1. A full term 5 pound, 10 ounce white male infant was born spontaneously at 12:14 a. m., January 23, 1949, after nine hours of labor. The mother was a gravida 7 with three living children. Two full term infants died shortly after birth from "jaundice" and she had had one miscarriage. She had received transfusions during pneumonia in 1939.

Physical examination of the child at birth gave normal findings except for mild icterus. The red blood count was 4.58 with 14.5 grams of hemoglobin. By 11:45 a. m., the red blood count had dropped to 3.10 with 9 grams of hemoglobin. The infant's color was orange yellow and there was slight edema of the skin. The liver edge was felt 2 cms. below the costal margin and the tip of the spleen was palpable. Fifty cc. of Rh positive blood (taken from the father) was given intravenously at 4:15 p. m.

On January 24 and 25, the counts stayed up fairly well and the infant's activity appeared normal. He ate well and the jaundice appeared to stay the same.

On January 26 difficult breathing with cyanosis developed following a feeding. Inspiratory crepitant rales were heard throughout both lung fields. Oxygen was started and 50 cc. Rh positive whole blood was given intravenously.

Respiratory difficulty persisted throughout the day and, in spite of intratracheal oxygen, coramine, adrenal, caffein and alpha-lobeline, the infant expired on January 27 at 5:50 a. m.

Laboratory Studies.—On January 23, 1:30 a. m., red blood cells were 4.58, hemoglobin 14.5 gms.; at 7:00 a. m., 3.73 and 12 gms.; at 11:45 a. m., 3.10 and 9 gms.; at 8:00 p. m., 5.13 and 15 gms., 4 normoblasts and 50 cc. Rh positive blood given. On January 24, 7:15 a. m., red blood cells were 4.64, hemoglobin 15 gms.; at 8:00 p. m., 3.83 and 13.5 gms.; at 11:30 p. m., 4.17 and 13 gms. On January 25, at 8:00 a. m. red blood cells were 4.51 and hemoglobin 14 gms.; at 4:00 p. m., 3.70 and 12 gms. On January 26, 8:00 a. m., red blood cells were 3.05 and hemoglobin 7.5 gms., 20 normoblasts and 50 cc. Rh positive whole blood was given; 8:00 p. m. 3.46 and 10.5 gms.

Rh Serology.—Mother was O ede/cde; father O CDe/CDe; siblings were CDe/cde, CDe/cde, died jaundiced, CDe/cde jaundiced, died jaundiced. The child reported was O CDe/cde, Coombs test not recorded; cord antibody 1:2.

Chest Plate.—On January 26, a chest plate showed lobular infiltrations throughout the entire right lung and in the upper half of the left lung. Cardiac shadow was slightly large and the cardiac curves were well preserved.

Therapy.—Besides blood, vitamins C and K were given; duracillin; hapten (200 mgs. intramuscularly on three occasions) and stimulants.

Case 2. This 7 pound, 9 ounce white male infant was born spontaneously at 6:00 a. m., August 12, 1949, after a five hour labor. This was the mother's first pregnancy. There was no history of her having ever received blood transfusions. Dusky cyanosis persisted in the infant from birth. Petechiae on the face and back, puffiness of the dorsum of the hands and feet and an occasional whining expiratory grunt were observed from birth. Physical examination further revealed a harsh grade II systolic murmur to the left of the sternum, suppressed breath sounds in the upper two thirds of the right chest, coarse rales in both bases and the liver edge 3 cms. below the right costal margin. The infant was placed in an incubator and oxygen was started.

The red blood cell count at birth was 1.08 with 5.2 grams of hemoglobin. Seventy-five cc. of Rh positive type O concentrated cells was given at 10:00 a. m. and at 2:00 p. m. By the next morning the edema had become marked; moderate icterus had developed but the red blood count was 2.71 with 9.8 gms. of hemoglobin. However, the liver edge was 6 cms. and the spleen could be felt 2 cms. below the costal margins. The infant had gained 100 grams in the previous twenty-four hours. One gram of serum album in 80 cc. 5 per cent glucose in water was given intravenously.

By afternoon the edema was profound and the infant's color was bronze. He passed only 1 ounce of urine in the previous twelve hours. Seventy-five cc. of 10 per cent glucose in water was given intravenously. During the succeeding twelve hours only 1½ ounces of urine was passed. The infant stopped breathing during a venipuncture at 10:00 a. m. on August 12 but was revived with artificial respiration and coramine. Gasping respirations subsequently developed and the infant expired at 10:25 a. m. on August 14.

Laboratory Studies.—On August 12, at 7:00 a. m. red blood cells were 1.08 and hemoglobin was 5.2 gms., and 75 cc. Rh positive concentrated cells were given twice; at 3:30 p. m. 1.71; at 9:00 p. m., 2.30 and 9.1. White blood cells were 142,000 uncorrected, 28,130 corrected; differential count showed 10 stabs, 28 segments, 52 lymphocytes, 6 monocytes, 2 myelocytes; total nucleated red cells were 548, polychromatic 130, orthochromatic 212, basophilic 206. Icterus index was 200. Blood type of mother was O Rh negative, of infant AB Rh positive. On August 13, at 8:30 a. m., red blood cells were 2,71, hemoglobin 9.8, 1 gram of serum albumin; 8:30 p. m., 2.2 red blood cells. On August 14 plasma proteins showed total 4.78 grams per cent, albumin 2.91 grams per cent and globulin 1.87 grams per cent.

DISCUSSION

PETER G. DANIS, M.D.: The two cases presented

are representative of an interesting and serious problem in the newborn baby. The first case reported is from a family which had this problem for some time and the mother has given birth to a number of infants which demonstrate a number of variants of the disease.

It was obvious that this child was a problem from birth. It was treated vigorously with blood because of the anemia, which in this case was anticipated because of the family history. However, the problem one faces in practice is the unanticipated case and there are certain things which must be emphasized, both in preparation for and in immediate handling of such cases. Certain criteria, upon which I think Dr. Hamilton will comment, might give some idea of what to expect.

When hemolytic anemia of the newborn is a possibility, it is important to look at the baby. When a newborn baby is brought into the nursery, one can gain something of value by palpating the abdomen and seeing if the baby has a large liver and spleen. Look at its general appearance, its color, its breathing and so forth and assay the child as a whole.

The immediate care of these babies should be devoted to the baby as a whole. Administer O^2. Then find out how how severe the anemia is. There are various tests which are of assistance. Those cases which have a high erythroblast count at the time of birth are usually the most serious. It is rare to see a baby with a low erythroblast count at birth that is in immediate need of heroic measures to save its life. When one has the technical assistance, it is customary to do a Coombs test on the baby. I have always observed that the first thing I am asked about is the Rh factor. Such information is irrelevant at the moment. More important is the question of whether or not the baby does have the disease. I want to emphasize this because so often the intern does not know if there are erythroblasts in the blood smear, whether the baby has anemia or whether the Coombs test is positive but only that the baby is Rh positive.

The baby born with this disease can be quite pale, breathe with difficulty and have edema. Such cases are fairly obvious and if there are petechiae on the skin, a large heart, liver and spleen, therapeutic assistance will be needed at once. Usually, however, a baby does not show such a dramatic picture but develops definite icteris tinge to the skin during the first twenty-four to forty-eight hours and that is when the physician is called to see the infant. When such a baby is seen, I think the intelligent thing to do is to get and see a red count, hemoglobin and blood smear to see if there is an anemia or an increase in erythroblast. It is not necessary to have any erythroblasts in the blood smear at all. There are some babies in whom new blood is being formed at the same rate at which it is destroyed so that erythroblasts do not appear. There may also be another thought on that; the baby that has a lot of erythroblasts may have an active hematopoesis in the liver and the baby who has little or no erythroblasts may be the baby whose liver has not developed extensive extramedullary hematopoesis to combat this disease. In such cases one has a form in which jaundice is extreme but there is relatively little anemia. There may be factors which may influence this. For instance, the same baby may be dehydrated instead of edematous and the hematocrit may be high; the intense icterus may interfere with the tests for hemoglobin. One may be faced with three different forms: (1) a baby born anemic and edematous with petechiae of the skin, (2) a baby with extreme jaundice without much anemia, and (3) a combination of both.

The point that is particularly interesting in the first case is the family history. This family had had two children, both normal. The mother developed lobar pneumonia and was given a transfusion of her husband's blood. As a result of that transfusion, which contained the Rh antigen substance, she was sensitized and formed antibodies. When she became pregnant with an Rh positive fetus she developed a high titer of antibodies which passed to the infant and damaged the infant's red cells producing a severe anemia. At the time this occurred, nothing was known about the Rh factors. The baby was given three blood transfusions but it died on the fifth day.

The next baby was born with extreme erythroblastosis more than a thousand erythroblasts per 100 white blood cells. The obstetrician immediately took some blood from the father and gave the baby a large transfusion. The baby made a remarkable recovery and is alive today. Then the next child was born, the Rh factor was known about and and Rh negative blood was given but the baby developed anuria and jaundice became extreme on the third day and, although the red count was excellent, it died in a manner similar to that of uremia. When the next pregnancy occurred, Rh hapten was used and Dr. Hamilton will discuss that.

From the number of deaths in this particular family, this disease would sound discouraging but I want to modify that concept. In the City of St. Louis today there are relatively few families that are confronted with this constantly fatal type. It would seem that when the original sensitivity is produced by blood transfusions, the sensitivity is greater. Fortunately, today women are not getting mismatched Rh transfusions. The outlook in most families from baby to baby is something about which I do not believe one can come to a conclusion. In most families the disease may be severe in one infant and mild in another and one sees many families in which the mother is Rh negative and the father is Rh positive and the babies are all normal. I wanted to say further that there is more to the treatment of this disease than blood transfusions. The abnormalities in the liver are real and anything that can be done to improve liver function and increase elimination of the excess bile pigment is constructive treatment. Consequently one gives these babies glucose to stimu-

late kidney output, and, to improve liver function, liver injections and choline can be used.

Eugene Hamilton, M.D.: I was asked to discuss these cases and say something about the prenatal management of such cases in general. One of these mothers was one of the first patients to whom we gave Rh hapten. The theory behind the hapten was that the antigenic molecule could be stripped of its protein or antibody producing factor but leaving a specific substance which, when injected into a person who had Rh antibodies, would combine with them to render them inert.

The woman began treatment with hapten fairly late in the pregnancy, at about six months, and she was given hapten twice but there was no drop in antibody titer and there was no improvement in the baby at birth. According to the history the fate of the baby after birth was about the same as the preceding untreated one had been. So that case, in association with others, leads one to believe that there is no value in this method of treatment.

I would like to emphasize that from a statistical standpoint the disease is not an important one. There are so many important aspects of the disease and so much has appeared in the literature that one may gain the impression that the disease is more important that it really is. I do feel, however, that there are more than a few families in St. Louis that are faced with the problem of severe sensitivity to the Rh factor. I feel that the really severe case occurs about one in every thousand live births. So if in the City of St. Louis there are 20,000 deliveries a year, there would be about twenty severe cases, which is not too bad. As far as the prenatal care for patients, again, because a lot has been said about the subject, there is a tendency for some people to go off the deep edge in the management of the Rh negative woman. When a woman has one baby and gets by without any sensitization, she is sometimes told that she should not have another baby and similar nonsense. When a primagravida is found to be Rh negative, I think it is important to test the husband and see if he happens to be Rh negative. If he is, one does not need to attach any significance to the problem.

During the first pregnancy in any case, one does not need to give the matter much consideration unless the woman has a history of having had a transfusion which may have sensitized her. It is rare that a woman gives birth to an erythroblastic baby in the first pregnancy. If one is particularly interested and wishes to find out if sensitization occurred during the first pregnancy, one can run an Rh antibody titer two to six weeks after delivery and if she has antibodies, one can be reasonably sure that she was sensitized. If one takes the same patient and three or four years have elapsed before she again becomes pregnant and during the first or second month of her pregnancy the antbody titer may be negative, one would have no way of telling whether or not she was sensitized. With the second pregnancy there is always the possibility that sensitization will develop and it is important to check the titer during the first two months of pregnancy, or before she reaches the third month of pregnancy because at that time the antigens have not developed in the fetal erythrocytes, and so one can be certain she has not developed any antibodies from that particular pregnancy and, if antibodies are present, they have persisted from the previous pregnancy. If the baby should be Rh positive, the outlook for that particular child would be poor. The prognosis is poor if, under ordinary circumstances, antibodies exist in the mother's blood from the time of conception. As a general rule, if antibodies develop during pregnancy, even though they develop in the fourth month or so, the prognosis for that child is usually not so bad. With succeeding pregnancy there is more and more of a possibility statistically that the Rh negative woman will become sensitized. If one checks the patient in the first months of pregnancy and finds that she has anti Rh antibodies, there is not much use in checking continuously through pregnancy because the antibody titer may continue to rise in a sensitized woman even though the fetus is Rh negative and will not be involved with erythroblastosis.

Thus if the antibody titer is positive in the beginning of pregnancy, in all probability it will continue to be positive and may increase in titer.

Walter Rice, M.D.: In this first case the positive anatomic findings were as follows: (a) skin and sclerae were jaundiced, (b) there were peteichial and purpuric hemorrhages in the skin, (c) there was some ascites but no edema, (d) the lungs were reddish and congested and showed evidence of hemorrhage, (e) the liver was enlarged weighing 110 grams (normal 75 to 80 grams), (f) there was hemorrhage in the medulla of the adrenal which looked soft in the gross, (g) the basal ganglia of the brain were yellowish and discolored.

These cases were selected from a considerable number of cases in the St. Mary's Group of Hospitals. Estimation of the frequency of a particular disease is difficult, especially in teaching hospitals in which the number of cases are influenced by the reputations and interests of the men on the staff. However, an incidence of one per thousand births sounds like a low estimation and is not in accordance with other published figures. I know these figures are hard to assess but some people have calculated the incidence to be closer to one in three hundred live births. There is no point to be made in argument about frequency except that erythroblastosis fetalis is considerably more frequent than congenital syphilis in newborn infants and one goes to considerable trouble to diagnose syphilis in prenatal examinations. At least a proportionate amount of trouble might be expended on the investigation of this other serious disease of the newborn.

In the clinical records of this case the erythroblasts in the blood were low and at one time four per 100 nucleated cells was recorded and at another time twenty per 100 nucleated cells. As I will show later this hypoplasia of erythroblasts is often a feature of this disease. This disease is not properly called erythroblastosis any more than it is properly called hemolytic disease of the newborn. Erythroblastosis, an American term, accentuates the proliferation of erythroblasts. Hemolytic disease of the newborn, an English term, accentuates the destruction of the red cells. Neither gives a complete picture of the variable processes. It is antigen antibody reaction which exhibits these and other features in variable combinations and severity.

Microscopic Examination. — The lungs showed hemorrhagic consolidation and a fibrinous alveolar exudate.

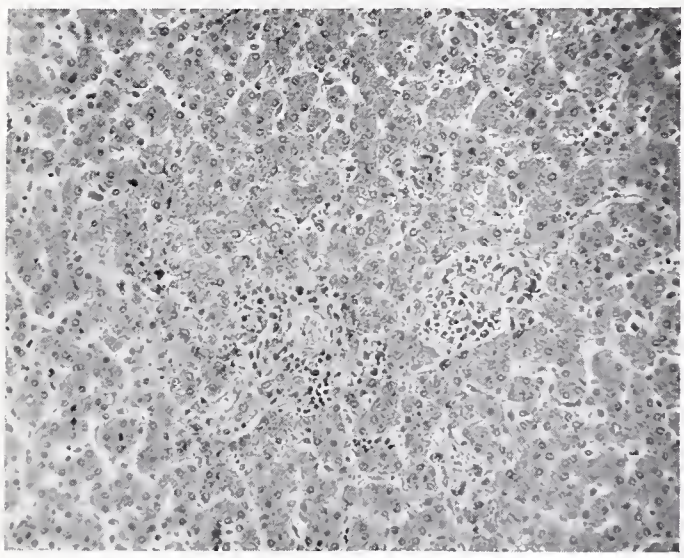


Fig. 1

In the liver the hepatic cells were filled with small globules which are not fatty in type. While in some cases there may be considerable fatty degeneration, in this case this is inimical. These globules represent hydropic degeneration of the liver cells. The cytoplasm contains vacuoles in almost every instance. There is also considerable change in the nuclear pattern. The cells have a shrunken appearance in many places. In the center of the field in the photograph there are two portal areas and in those areas there are many erythroblasts. Erythroblasts are not uncommon in any newborn infant. This picture should be compared with the liver in the second case which exhibits an entirely different feature. Both of these cases are cases of so-called erythroblastosis fetalis but in this instance the erythroblasts are, if anything, fewer than normal. However, attention should be called to the relative immaturity of those cells which are present. There are few mature erythroblasts. This is an important feature.

The liver also showed in some other sections hemosiderin. This is not entirely unexpected in view of the excessive destruction of the red blood cells in this disease.

Islands of erythropoesis were found also in the spleen and thymus.

The next section (fig. 2) is of the adrenal gland which has generally been neglected in discussions of this disease. This photograph shows the cortex of the adrenal gland with zona glomerulosa and reticularis. In the center there is the area of degeneration. There is depletion of lipoid. The cells do not contain the normal amounts of lipoid which are usually seen. The cells are swollen, distorted and even, in some instances, necrotic. This represents considerable damage to the adrenal gland.

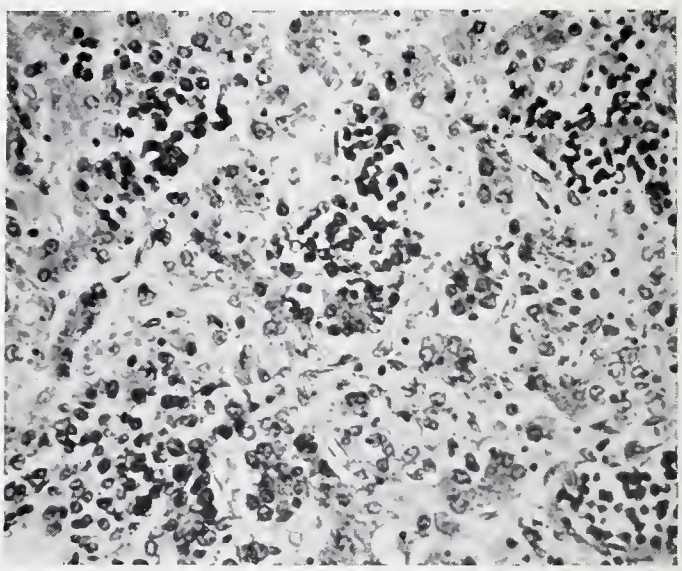


Fig. 2

The second case showed a different clinical picture from the point of view of the blood. There was an excessive erythroblastosis or, more correctly, erythroblastemia. Now would be a good time to distinguish and define these two words. Erythroblastosis fetalis as a diagnostic term for this antigen antibody reaction in the newborn is firmly engraved in medical literature. It should be reserved for this specific disease in which an antigen antibody reaction can be demonstrated. Erythroblastemia is a symptom, or the condition, in which there are excessive numbers of erythroblasts in the peripheral circulation. This point, already mentioned by Dr. Danis, indicates that erythroblastemia may exist from other causes than the disease, erythroblastosis fetalis. There was an example recently at St. Mary's Hospital. A newborn infant exhibited an excessive number of erythroblasts in the peripheral blood. A check of the mother's Rh type showed that she was Rh negative (D-negative). Immediately the cry went up "This is a case of erythroblastosis fetalis." A check of the mother's serum and the infant's red cells for possible agglutinins showed none to exist by the most delicate technics. Furthermore, the cells showed no evidence of a coating of antibody. The infant cells themselves were Rh negative

(D-negative). No maternal-fetal incompatibility existed.

At this point I should like to digress briefly. I agree with Dr. Danis that serologic tests of the infant's genotype (the infant's Rh type) can be confusing, equivocal or in absolute error owing to antibody coating. However, this coating may be demonstrated by a Coomb's test and if the Coomb's test is negative the serologic tests for red cell antigens will be accurate. To return to the pseudo-erythroblastosis, a further check of the father disclosed that he, too, was Rh negative (D-negative). This was not then a case of erythroblastosis fetalis which the superficial examination had suggested. A little further investigation showed that the child had meningitis. The erythroblastemia was in response to the infection. A pure culture of pneumococcus was grown from the meninges. So, the mere presence of erythroblasts in the peripheral blood does not establish this diagnosis by any means. Nevertheless, this second case shows an excessive erythroblastemia.

The photograph of the liver reveals an excessive number of erythroblasts in varying states of maturity. There is a maturation arrest with many primitive forms and little evidence of active differentiation. I would like to call attention again that there is extreme damage to the parenchymal liver cells. These are much more severely damaged than in the previous case. The liver cords

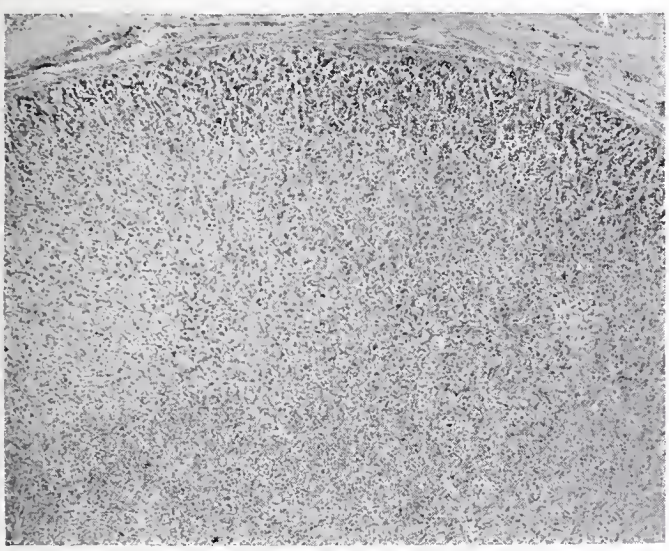


Fig. 3

can hardly be distinguished. The cells are granular and swollen and the architecture is distorted. One can imagine how little function these cells have. In this instance the liver weighed 200 gms. (normal approximately 75 grams).

The spleen also was grossly enlarged and weighed 20 grams (normal 8 or 9 grams).

The adrenals were fairly large and tan yellow in the outer layer. The cut sections showed yellow homogenous cortex.

The lungs showed hemorrhage which is a feature of this disease. I was pleased to hear Dr. Danis accentuate the feature of damage to the liver itself which is one of the most important features of the disease.

The adrenal gland showed again a most severe necrosis with areas of hemorrhage and granular necrosis and degeneration involving the greater portion of the internal parts of the gland. What

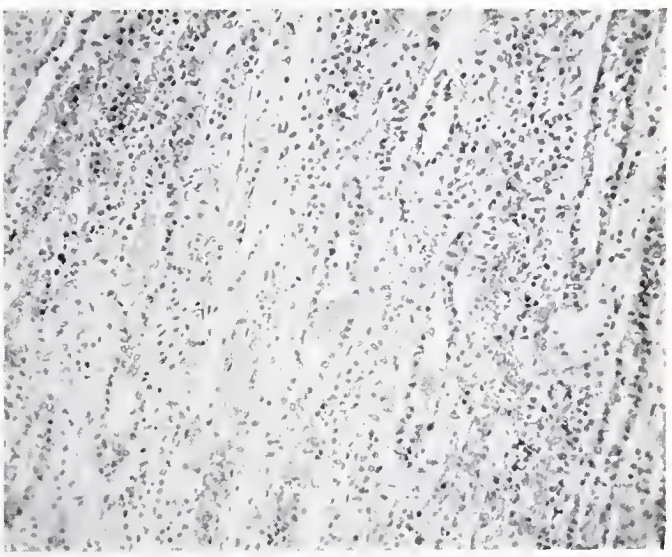


Fig. 4

the effect of this lesion on the child's ability to withstand stress, one can only surmise. A feature of the lesion was the infiltration of leukocytes. There also were some areas which might possibly represent erythropoeisis although that is not marked.

The next photograph of the kidney showed a moderate lower nephron or anoxic nephrosis. In some of the tubules the cells are swollen and red while some others have seemed to escape. There has been damage to tubular epithelium which is selective. In one corner there is a blood vessel with a clump of red cells. There has been excessive hemorrhage and in some of the ascending and descending loops of Henle there are eosinophilic masses of debris forming tubular casts. This feature is not unlike that seen in lower nephron nephrosis due to blood transfusion and, since that is also an antigen antibody reaction, it is not entirely unexpected. Apparently agglutinated red cells in a vessel should be considered as an artefact and not significant.

Examination of the erythroblasts of the peripheral blood are of interest. These cells are primitive and young. They lack maturity. They contain little hemoglobin. They are not normally or adequately differentiated.

The next photograph is a section of the placenta showing trophoblastic tissue and chorionic villi. The blood vessels were filled with erythroblasts having a primitive appearance. This placenta was also edematous and the choronic villi were swol-

len. Placentas from these patients frequently are swollen and edematous.

This is a brief preview of pathogenesis. Table 1

Table 1. *Erythroblastosis Fetalis*

Type	Predominant Feature
Hydrops fetalis	Edema, acites
Icterus gravis	Hemolytic jaundice; obstruction jaundice.
Anemia of the Newborn	Hypoplastic anemia, hemolytic anemia.
Kernicterus	Central nervous system neurone death; pigmentation.

indicates a classification of erythroblastosis fetalis and the generally accepted types: hydrops fetalis, icterus gravis, anemia of the newborn. In each case the condition is named for the predominant feature although the triad of edema, jaundice and anemia exist in all. There is also jaundice, in hydrops fetalis but the main feature is edema and acites. In icterus gravis, pigmentation is the worst feature but there is also a variable degree of anemia and edema. A severe anemia may have considerable jaundice and may even have some subclinical edema.

Kernicterus is separate and apparently unrelated to the edema, jaundice or anemia, *per se*. It may, however, have an indirect association with the severity of the jaundice since it may be related to the severity of the liver damage.

Table 2 shows some of the possible causes of increased endothelial permeability which in turn

Table 2. *Edema*

1. Increased endothelial permeability.
   a. Antigen antibody reaction.
   b. Anoxia.
2. Hypoproteinemia
   a. Deficient protein synthesis by liver.

may be due to an antigen antibody reaction and anoxia. There is quite good reason to believe that endothelium which also derived from the same cells as the red blood cells may also contain the Rh antigen. It may, therefore, be affected also by the presence of an antibody transmitted from the mother. If that occurs then the endothelium will be damaged, exhibiting increased permeability to fluids. This results in an increase in the interstitial fluid, which is edema. Anoxia due to anemia will indirectly produce similar damage and edema. Hypoproteinemia due to damage to the liver, or hemorrhage, and extravasation of serum proteins may be an additional factor producing a vicious cycle.

Table 3 concern jaundice. The jaundice is of two

Table 3. *Jaundice*

1. Hemolysis	Antigen antibody reaction
2. Biliary blockage (obstruction)	Antigen antibody reaction; pigment overload; displacement of liver cells; anoxia.

types, hemolytic and obstructive. The obstruction usually develops after the hemolysis. The obstruction is partially due to the damage which was present in the liver and partially due to physical displacement of the liver cells by the proliferating erythroblasts. The liver damage may be directly due to anoxia, or even an antigen antibody reaction.

Table 4 concerns anemia. This is due to hemo-

Table 4. *Anemia*

1. Hemolysis	Antigen antibody reaction
2. Hypoplasia	Antigen antibody reaction; maturation arrest.
3. Hemorrhage	Increased endothelial permeability; defective prothrombin synthesis

lysis, to hypoplasia and to hemorrhage. The hemolysis is the result of an antigen antibody reaction which destroys the red cells and the hypoplasia is a matter of maturation arrest. These erythroblasts are primitive and not developed as they should be. I believe the maternal antibodies act directly on the marrow and on the extramedullary areas of hematopeoisis by producing a maturation arrest, preventing the production and release of an adequate number of red cells, thereby producing an anemia. Certainly, that is a factor in the milder cases of prolonged anemia which often follow this condition. Hemorrhage as a cause of anemia tends to be underestimated but is an important feature. It is the result of two factors: increased endothelial permeability and defective prothrombin synthesis due to the damage to the liver.

Kernicterus (table 5) is the result of damage to

Table 5. *Kernicterus*

Neurone degeneration	Antigen autibody reaction; microemboli; anemia.
Pigmentation	Bilirubin absorbed on
Hemorrhage	damaged cells.

the central nervous system, specifically trauma, to the neurons. This may be due directly to antigen antibody reaction. Rh antigens in the central nervous system have been demonstrated in Van Loghem's laboratories in Holland by Soeter's. It has been suggested that the lesions are due to emboli of small vessels but that is quite unlikely. The damage, however, may also be accentuated by anemia. A point that is not included in the table which is most important is that it may be due to a toxin not yet known, which is produced by the damage to the hepatic cells. There seems to be some connection between the development of kernicterus and the excessive damage in the liver. That, of course, is known in other diseases as well (hepatolenticular lesions of Wilson's disease). Pigmentation usually follows the damage, and hemorrhage may occur in the softened areas as it often occurs in the central nervous system under other conditions.

The following few points on inheritance of the Rhesus factor are relevant to this discussion.

1. The Rhesus factor is in reality a complex group of red cell antigens.

2. Each individual has a minimum of three and a maximum of six grouped red cell antigens in the Rhesus series.

3. The red cell antigens are paired in three groupings.

4. The red cell antigens are inherited as the result of the presence of paired genes in the chromosones.

5. The red cell antigens each react specifically with a different antiserum.

6. The genes are paired on three adjacent loci, named respectively C, D and E. This is in accordance with the generally accepted Fisher-Race theory of inheritance of this factor. Although there is opposition to this theory, it does provide a readily understandable explanation of an otherwise complex subject. Thereby is its value.

7. Each chromosone on each locus carries allelomorphic (alternative) genes which determine the antigenic specificity of the particular red cells.

8. An individual may be heterozygous for each of the three loci. Since dominance of one gene over another does not occur, the cells of the individual with both allelomorphs, one from either parent, will react with both specific antiserum. For this reason, the child of a C-positive father and a c-positive (C-negative) mother will have both C and c antigens and his cells will be agglutinated by both anti-C and anti-c serums. The C-antigen is not dominant over the c-antigen. This has led to considerable misunderstanding, it being held that the Rh positive (D-positive) child of an Rh negative (D-negative) will not tolerate Rh negative blood which is incompatible. From the foregoing, it becomes apparent, however, that the Rh negative blood is just as compatible from the point of view of inherent red cell antigens and more compatible from the point of view of transmitted maternal agglutinins. It is not possible for such an infant to develop immunity to the Rh negative blood. This point is made since I would not want it felt that it was a unanimous opinion that these cases should receive Rh positive blood. The feeling that Rh negative blood is incompatible is based on a false premise. That Rh positive blood is the treatment of choice for these infants is not unanimously held. Dr. Danis already knows my opinion on this subject. These infants should be transfused with blood compatible with the maternal serum antibodies which are thus responsible for the disease.

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*Perloff, W. H.: Am. J. Obst. & Gynec. 58:684 (Oct.) 1949.

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Case Report

TARDY SHOULDER HAND SYNDROME FOLLOWING UNUNITED FRACTURE OF CLAVICLE

GARRETT PIPKIN, M.D.
KANSAS CITY

IRVING WRIGHT, as guest speaker at the Kansas City Southwest Clinical Society Conference in 1950 at Kansas City, in a discussion of the shoulder hand syndrome, cited a bilateral case. He drew attention to the meager literature on this subject and requested that other similar cases be reported.[9] The case I am reporting is of additional interest in that it evaluates the two possible forms of surgical therapy in the adult; viz, bone grafting versus excision, as this patient for a short time had a successful bone graft before it fractured and excision was elected.

There is little literature on the entire subject of ununited fracture of the clavicle. There is even less literature on this particular phase of the subject. The standard texts of surgery dismiss the subject of clavicular fractures with the statement



Fig. 1. Before operation

that such fractures unite, generally with slight deformity but an excellent functional result. Orthopedic literature goes a step farther and recognizes that ununited fractures of the clavicle occur, but is chiefly concerned with bone grafting procedures for its correction.[1, 2, 4, 5, 6] Insofar as I can determine Watson-Jones reported the first case of tardy shoulder hand syndrome, following ununited fracture of the clavicle, in 1940.[8] Ghormley probably had one such case in his series of twenty nonunions reported from the Mayo Clinic in 1941[5] for in his comment he states: "The patient who showed evidence of pressure on the brachial plexus also presented signs of interference with the venous circulation of the arm." Støren[7] reported such a case in 1946. Wright[9] is the first to describe a bilateral case.

REPORT OF CASE

The case reported is of a 39 year old white female.

Present History.—She had had frequent episodes of cyanosis with pain and tingling in her right arm of about

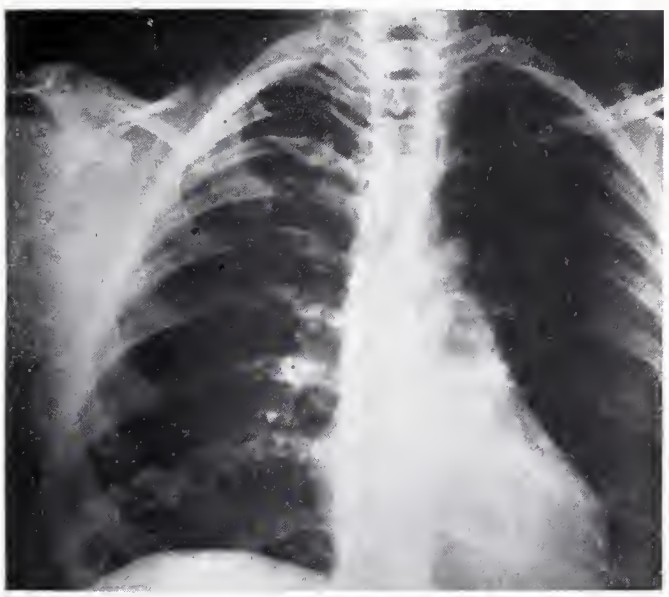


Fig. 2. Nonunion of right clavicle.

one year's duration, increasing in severity the last two months, and aggravated by placing right hand in cold water. Cold water may also initiate cyanosis.

Three days before admission, while washing clothes in a tub, a "knot popped up above the right collar bone about like an egg." Her right sleeve became tight, her arm cramped and got weak. The back of the hand "got so tight" she thought "it would burst." The arm "got huge" and its "color very bad." She was ordered to bed by her physician. Heat gave no relief. Ice packs had given some improvement in symptoms in the last thirty-six hours.

The right clavicle had been fractured twice, at the ages 4 and 7. There had been occasional tingling in the arm since the age of 10.

Some general physical findings should be noted. The patient was a moderately obese white female, aged 39, oriented and cooperative, and without other com plaints, at the time of first examination, or subsequently, through a period of two years observation. Her pulse sitting was 88, temperature 98.8 F. and respiration 22. A chest plate was interpreted as normal. Her blood pressure in her left arm was 130/90 mm. Hg. Routine laboratory examinations were not pertinent.

The principal findings were in the right superior extremity. The right arm was markedly swollen. It measured 4 inches more in circumference than the left. The right forearm and hand also were swollen but not as markedly by comparison as was the arm. The dorsum of the hand was puffed and pitted with pres-

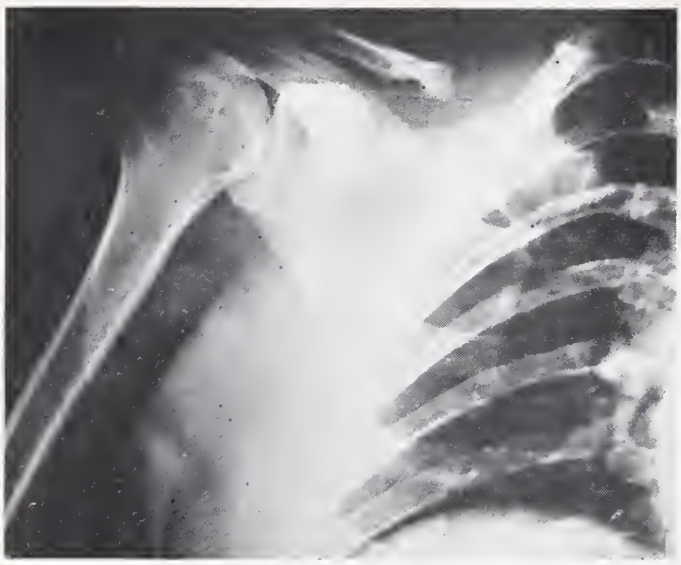


Fig. 3. Nonunion of right clavicle.

sure. Its veins were distended, giving the hand a moderate cyanotic color. The radial pulse was weak. The right clavicle had a knoblike deformity in its midportion in which two bony fragments could be distinguished between which a mass pulsated (fig. 1). Moderate motion between the two bony fragments occurred in various shoulder attitudes. The right shoulder was lower and its span was one-half inch less than that of the left.

X-rays confirmed the presence of an ununited fracture of the right clavicle (figs. 2 and 3.)

Tibial bone graft with intramedullary fixation was performed in two stages (fig. 4).

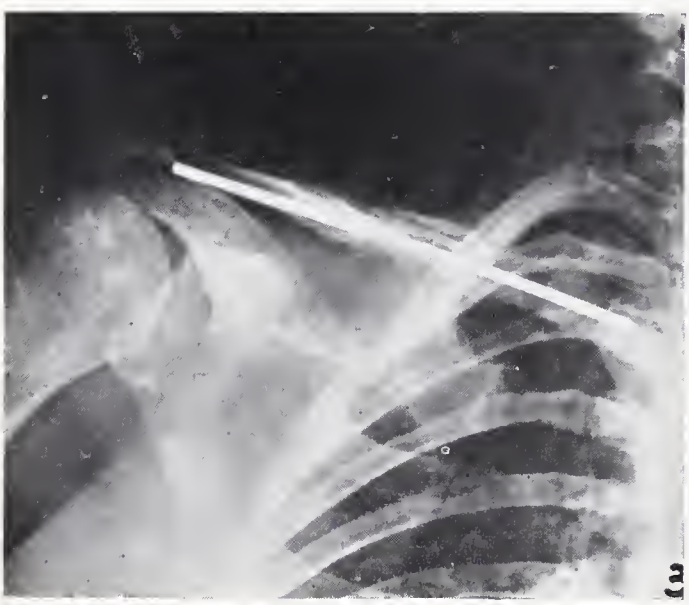


Fig. 4. Tibial grafts with intramedullary fixation.

The external jugular vein suspended the subclavian vein between the fragments of the clavicle. The distal fragment of the clavicle "rode" on the axilliary artery so that the principal obstruction was to the venous circulation some arterial obstruction was also present (fig. 5). In fact, the configuration of the two bony ends of the fracture fragments was considered the result of pressure erosion phenomena, much the same as an aneurysm shapes the vertebral body. No evidence of a false joint, or bursal cavity, was present between the two fragments of the clavicle, so I describe this case as an "ununited fracture" rather than a "pseudo-arthrosis" of the clavicle.

External postoperative splinting was effected for four months and the intramedullary wire removed in six months. Bony union with restoration of medullary cavity was then reported present (fig. 6).

For a period of three months the patient had a stable clavicle and increasing use of her extremity. She had no pain. Swelling of the extremity, of course, had subsided with immobilization and elevation, and recurred to some slight extent when dependency was permitted again. This decreased with increasing use of the limb. The veins of the hand decreased in size. The patient had been advised to return to her job as a power machine operator. Months after the initial

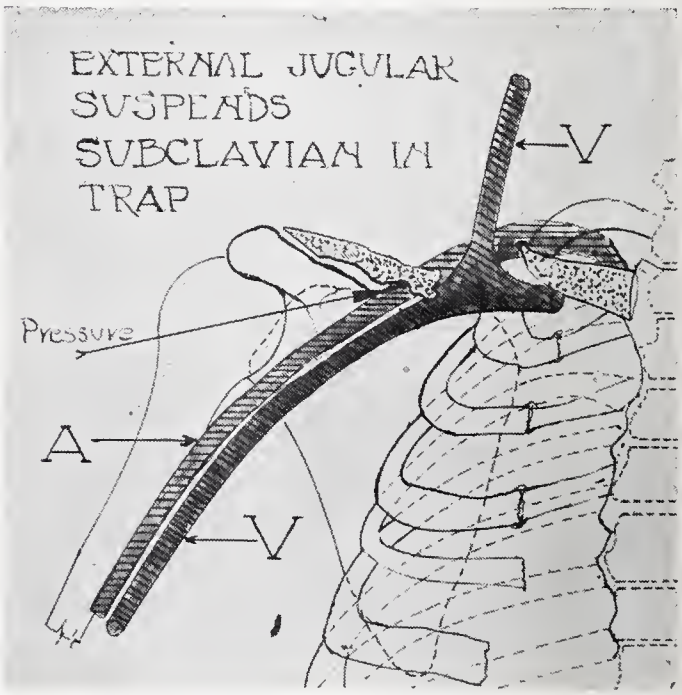


Fig. 5. Surgical Findings: The external jugular vein suspends the vascular bundle in a trap between the ununited ends of the clavicle. "A" arterial system; "V" venous system.

operation, while hanging curtains, pain developed at her operative site. Check x-rays showed a refracture present (fig. 7).

After temporizing several months, during which time recurrent pain and swelling developed with use or dependency, excision of the clavicle was performed (fig. 8).

Postoperatively, full motion was started in two weeks.



Fig. 6. Six months after grafting.

One month after excision of the clavicle, the patient volunteered that her extremity was much better than it had ever been. She had no pain, the veins in her hand had collapsed and the extremity showed no tendency to swell. She was impressed by her range of motion.

She has been followed one year since excision. Her shoulder stability is illustrated in fig. 9. The right arm has decreased in size to only 1 inch larger in circumference (preoperative measurement 4 inches larger). The right hand still swells slightly on prolonged dependency and fatigues with heavy use such as mopping and waxing floors. The veins of the hand remain collapsed. Recent infra-red studies demonstrate little difference in the two hands. The patient has no pain. She tolerates cold water. She feels able to do all of her own work. She has not returned to her original job as a power machine operator, as the company which employed her does not consider her physically fit without a clavicle, although the same company did employ her with an ununited clavicle.



Fig. 7. Graft fractured ten months postoperatively.

The intern, after his history and physical examination, suggested Raynaud's disease, so the vascular phenomena must have impressed him.

In my opinion the important point of the case is the patient's own evaluation of the surgical therapy employed. Some justifiable debate could exist as to the efficacy of grafting the clavicle versus its excision. Berkheiser stated on the subject of ununited fractures of the clavicle that the "Literature is limited and opinions as to treatment rate."[2] On the side of a successful graft are the superior strength of the extremity and possibly a better cosmetic result. Against it are time, in this case four weeks as against a minimum of six months, no inconsiderable economic factor in a wage earning adult; loss of motion and, as in this case, the probability of fracture of the graft with recurrence. I do not see any indication for cervical sympathectomy.

It should be kept in mind that these people have accustomed themselves to an abnormal range of shoulder motion permitted by their nonunion. Even though the grafting procedure should result in normal shoulder motion, which seldom occurs in adults immobilized for four months, the patient will consider this a limitation of his former freedom. The tendency will be to force motion, a factor contributing toward the probability of refracture.



Fig. 8. Clavicle excised.

This patient had a stable clavicle for three months and was thus able to compare that with the result of an excised one. She likes the latter the better.

Copeland[3] in reviewing the literature on total resection of the clavicle could find only four reported cases, to which he added two of his own. This is surprising, as the procedure is indicated in pathologic fractures, chronic osteomyelitis, cer-



Fig. 9. One year result.

tain tumors, certain types of thoracoplasties, successful cases of arthrodesis of the shoulder to obtain more motion, and for surgical exposure. Copeland concluded that total resection of the clavicle was a procedure followed by a short period of disability, not shocking, and not followed by loss of function or disability. I can not agree with this entirely. Some deformity occurs (fig. 9). This is slight enough to be masked by an extra pad in tailoring. Abnormal ranges of motion, particularly increased cross chest ranges (adduction), are present, which the patient likes. Stamina is lessened in comparison with the opposite extremity, and this loss constitutes the principal disability resulting in this case.

CONCLUSIONS

A tardy case of shoulder hand syndrome following ununited fracture of the clavicle is reported.

In the surgical treatment of this condition in the adult, excision of the clavicle is the method of choice over bone grafting, unless the individual has some occupation demanding strenuous shoulder exertion.

St. Joseph Hospital.

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PRESIDENT'S PAGE

Ever since I can remember anything about the practice of medicine we have been confronted with innumerable problems. Right now medical education faces a financial crisis. I can recall the demise of numerous medical diploma mills and the gradual elevation of medical education from the days when medical schools were frequently operated for profit only. Since those days we have traveled a long way to our present pinnacle of success. In 1910 there were 162 medical schools in the United States, ranging in quality "from good to disgraceful." Now there are seventy-two fully accredited four-year medical schools. This reduced number reflects our efforts to improve the quality of medical education. That we have succeeded there can be no doubt, but it has been done at the price of greatly increased costs which have become critical for many universities.



Several solutions, or at least part solutions, have been suggested by the commission on financing higher education, several of which I would like to comment upon.

It has been suggested, and not unreasonably so, that medical schools can economize; but it must be pointed out that even if operated in the strictest economical fashion more money for operation would be needed, and perhaps the time has come to re-evaluate our medical school teaching curriculum. One of the costs charged to medical schools is for research. There is apparently considerable available money for research. No one would deny the importance of research programs but it seems only fair that no medical school should undertake projects which do not pay their own way. Possibly some additional student charges might be made but revenue from this source should not be increased to the point of becoming an insurmountable barrier to prospective students.

States oftentimes can increase appropriations for medical education but again this should not be done at the expense of other educational programs. It has also been proposed that the federal government subsidize the medical schools. I believe that this is a hazardous proposal introducing a new type of assistance and, until it has been demonstrated that medical education cannot be financed by other means, no such plan should be tried.

Fortunately several organizations have taken up this problem and with only reasonable support should succeed in alleviating the situation. The American Medical Association has taken steps in this direction by the establishment of the American Medical Education Foundation. This Foundation recently has been joined with the National Fund for Medical Education, the latter headed by Herbert Hoover who directs a board of illustrious influential laymen, college presidents, industrialists and business men from all walks of life. It is hoped that these two organizations working together can rescue the medical schools from their major financial difficulties. For 1951 they hope to raise five million; the A.M.A. is looking to the doctors for at least one million. Raising this sum is the alternative and opportunity we have now. It is not such an insurmountable task; if every physician in the U. S. contributed only $100 a year, we could raise eighteen million dollars annually and we could continue to develop medical education in our own way. Let's do our share and send our checks to the American Medical Foundation Fund.



Editorials

STATE LEGISLATION

The Missouri Legislature is now in recess until September 10. All measures which were not disposed of prior to the beginning of the recess will be considered when the Legislature returns.

The bills of interest to medicine which are yet to be considered are listed under "Legislation Pending." Of these the Association has approved S. B. 245 and S. B. 68. It has opposed and will continue to oppose S. B. 214 and S. B. 136.

LEGISLATION PASSED

H. B. 68 amends the state merit system act which applies to all employees of the Department of Public Health and Welfare. The amendment provides that the two year residency requirement for all employees be waived in the case of physicians and other professional personnel.

H. B. 229 provides that the boards of trustees of county hospitals shall have the right to increase the county tax levy from 12 to 20 cents on the $100 valuation for maintenance of these hospitals.

H. B. 248 provides that the Waynesville General Hospital located at Waynesville shall be sold by the state to Pulaski County for a small sum. The hospital was originally purchased by the state from the War Assets Corporation for the sum of $25,000. The Association has opposed the operation of this institution by the state during the last three years.

H. B. 288, similar to H. B. 229, authorizes St. Louis County to increase tax for hospital purposes from 12 to 20 cents per $100 valuation.

H. B. 66 creates a Department of Civilian Defense and outlines the various activities of the department.

S. B. 108 provides that payments for Blue Cross or Blue Shield may be withheld from the salaries of state employees.

S. B. 137 provides that the ceiling of $750.00 for medical and hospital expenses for injured persons under the Workmen's Compensation Act during the first ninety days of care shall be removed; further provides for the creation of a rehabilitation set up in the Workmen's Compensation Department. The bill contains the following phrase which was opposed by the Association: "Nothing in this act shall prevent an employee being provided treatment for his injuries by prayer or spiritual means, if the employer does not object to such treatment." (Efforts were made to have this phrase removed from the bill without success.)

LEGISLATION WHICH FAILED TO PASS

H. B. 317 would have provided that "Boards of Trustees of County Hospitals may require that all practitioners of medicine shall contribute on an equitable basis toward support of said hospital, but not to exceed 10 per cent of his fees for treatments of patients in such hospitals."

H. B. 327 provided for a state board to license naturopaths and to regulate the practice of naturopaths. Naturopathy is defined as that science, art or system of diagnosis and treatment of diseases and prevention of human ailments through the use of natural and physical agents.

H. B. 467 provided that the Board of Curators would finance the final two years of medicine of students at the University of Missouri at the school in which the student was accepted.

LEGISLATION PENDING

S. B. 68 provides for a new licensing board of nurse examiners, including two practical nurses as members; it further provides for methods of licensing registered nurses and practical nurses. It is in the Senate Committee on Public Health.

S. B. 136 provides that Blue Cross and Blue Shield, or similar plans, shall come under the supervision of the State Insurance Department and subject to the regulations of the Department. At present these plans are set up under state non-profit corporation laws and are not subject to tax. This bill is in the Senate Committee on Judiciary.

S. B. 214 provides for a Board of Examiners in psychology. It outlines the powers of the board and states how psychologists shall be licensed. It was recommended "Do Pass" by the Senate Committee on Boards and Bureaus. This legislation has been opposed by the Association.

S. B. 245 provides for increases in the license fees of Doctors of Medicine, payable to the State Board of Medical Examiners. The bill was perfected in the Senate. This legislation was approved by the House of Delegates of the Association at the request of the Board of Medical Examiners.

CIVIL DEFENSE EXHIBIT TO BE PRESENTED AT STATE FAIR

An exhibit on civil defense in the atomic age will be presented at the Missouri State Fair at Sedalia, August 18 through 26. It will be under the cooperative auspices of the Missouri Civil Defense Administration, the Committee on Emergency Medical Service of the Missouri State Medical Association and the United States Navy.

This educational display will feature pictorial reasons why the possibilities of atomic attack in this country need be considered and will portray some of the measures needed to prepare for such eventualities.

The exibit will be housed in a large tent 100 by 50 feet in a location suitable for attracting maximum attention of the thousands of Fair visitors.

Organization and Economics

NEWS

Virgil R. Wilson, M.D., Rosendale, and Fred K. Wilson, M.D., Winston, were two of six doctors at a family reunion in Independence on June 3. Three brothers who are dentists and a nephew who is an M.D. were at the reunion.

F. J. Longfield, M.D., Lathrop, was honored on May 25 on the completion of fifty years of practice in Lathrop. The mayor of Lathrop declared the day "Dr. F. J. Longfield Day."

A. N. Arneson, M.D., St. Louis, has been elected president of the St. Louis Medical Alumni Association.

D. B. Elrod, M.D., Cape Girardeau, was the guest speaker at an annual Future Farmers of America banquet at Malden on May 15.

First award of the Congressional Medal of Honor to an Army Medical Service man during the Korean conflict was made to the widow of Private First Class Richard G. Wilson, of the Medical Company, 187th Airborne Infantry Regiment. Private Wilson was from Cape Girardeau.

J. R. Bridges, M.D., Kahoka, was the only representative present of the class of 1888 of the Keokuk Medical College at a reunion of the Medical College's Alumni Association held at the Keokuk, Iowa, Country Club on June 18.

W. A. Bloom, M.D., Fayette, and Ira H. Lockwood, M.D., Kansas City, addressed the first meeting of the Missouri State Medical Secretaries and Assistants Society at Fayette, June 10. The society was organized at Kansas City on April 22.

MUSINGS OF THE FIELD SECRETARY

The 1951 Missouri State Fair takes place in Sedalia, August 18 through 26. In cooperation with the Bureau of Scientific Exhibits of the American Medical Association, the Missouri State Medical Association, through the Committee on Health and Public Instruction, is presenting that interesting and illuminating exhibit on "Mechanical Quackery." This exhibit will be located in the Educational Building in the exhibit section of the "Hall of Health" which is sponsored by the Missouri Health Council. Last year some 360,000 people visited the Missouri State Fair. This exhibit stands to capture the curiosity and interest of a good percentage of those who may be expected to attend the Fair this August.

The Missouri Academy of General Practice is now developing plans for another series of postgraduate courses this fall and winter to be offered at nine places in outstate Missouri; namely, Mexico, Louisiana, Rolla, Kennett, Macon, Farmington, Springfield, Sedalia and St. Joseph. All members of the county medical societies in these localities will receive further details on these meetings later as well as individual letters of invitation to the sessions.

With the continuation of regular monthly county medical society meetings over the state, proposed Councilor District meetings, various clinical conferences and regional meetings in the state all on the fall and winter calendar and the Academy program, it would seem safe to predict a full schedule of opportunity for refresher and postgraduate offerings to most physicians in the state.

The one day conference on "The General Medical, Dental and Hospital Care of the Indigent Sick" as announced in this column last month will be held on Wednesday, September 26, instead of September 19.

NEW MEMBERS

Baker, Cecil G., St. Louis.
Berger, Dan L., Kansas City.
Bindbeutel, D. A., St. Louis.
Eisele, Wm. Martin, St. Louis.
Ferguson, Robert L., Joplin.
Grebel, Clement B., St. Louis.
Grody, Marvin H., St. Louis.
LaDriere, Raymond J., St. Louis.
Miller, J. P., Lexington.
Neumann, Roland F., Jr., St. Louis.
Niesen, Frank Jos., St. Louis.
Pennington, F. E., St. Louis.
Reinhardt, Geo. R., Kansas City.
Schweiss, John F., St. Louis.
Simon, David Leo, St. Louis.
Smith, Garland F., St. Louis.
Stearns, Colby S., St. Louis.
Tindall, Robt. N., St. Louis.
Travis, Bane T., St. Louis.
Weisbrod, W. B., East Prairie.
Womble, James G., St. Louis.

DEATHS

Daley, Lyle M., M.D., Hamilton, a graduate of St. Louis University School of Medicine, 1908, member of the Caldwell-Livingston County Medical Society, aged 67, died April 13.

Ploch, Bernard, M.D., St. Louis, a graduate of St. Louis University School of Medicine, 1924, Fellow of the American Medical Association, member of the St. Louis Medical Society, aged 65, died June 2.

Macdonald, John W., M.D., St. Louis, a graduate of St. Louis University School of Medicine, 1905, Associ-



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ate Fellow of the American Medical Association, honor member of the St. Louis Medical Society, aged 73, died June 4.

Hotz, John W., M.D., St. Louis, a graduate of St. Louis University School of Medicine, 1925, Fellow of the American Medical Association, member of the St. Louis Medical Society, aged 51, died June 26.

THE COUNCIL

The Council met at the Sheraton Hotel, St. Louis, June 23-24, 1951, with Victor B. Buhler, M.D., Kansas City, Chairman, presiding.

Those present were Drs. Donald M. Dowell, Chillicothe; W. F. Francka, Hannibal; Armand D. Fries, St. Louis; J. F. Jolley, Mexico; R. W. Kennedy, Marshall; Victor B. Buhler, Kansas City; W. S. Sewell, Springfield; E. C. Bohrer, West Plains; Frank W. Hall, Cape Girardeau; C. Edgar Virden, Kansas City; J. W. Thompson, St. Louis; H. E. Petersen, St. Joseph; C. E. Hyndman, St. Louis; Victor E. Scherman, St. Louis; R. E. Schlueter, St. Louis; Robert Mueller, St. Louis; Messrs. John Noble and Lawrence Bradley, Kennett; D. E. Caywood, Springfield; Lemoine Skinner, Raymond McIntyre, T. R. O'Brien, St. Louis.

Society for Medical Research

Upon motion of Dr. Petersen, it was voted to contribute again to the Society for Medical Research in the amount of $50.00.

Conference on Physicians and Schools

Mr. O'Brien presented material from the Bureau of Health Education of the A. M. A. concerning the third annual Conference on Physicians and Schools which will be held at Highland Park, Ill., November 6, 7, 8. It was pointed out in discussion by Drs. Kennedy, Virden, Petersen and Mr. McIntyre that the health of school children in rural areas does not have sufficient attention, that this is a problem not only of the medical profession but of the Division of Health and the Department of Education and that a program should be correlated through these three organizations. Upon motion of Dr. Petersen, it was decided to refer this information to the Committee on Infant Care, suggesting that they invite the educational authorities, the state teachers' group and Dr. Hamilton for an orientation meeting. It was agreed that Mr. McIntyre and a physician should attend the conference.

Audrain County Hospital Suit

Mr. Bradley and Mr. Noble reviewed the Audrain County Hospital suit. They said that it had been requested that the case be heard by the entire Supreme Court and that it was on the banc docket and would come up the last of September or first part of October.

Legislation

Mr. O'Brien gave the status of state legislation which affects the practice of medicine. On the national scope, Mr. O'Brien said that the bill on aid to medical education would be approved by the A. M. A. to the extent of one time grants for construction purposes only.

Treasurer's Report

Dr. Hyndman reported that the finances of the Association were in fair condition and that the assessment was being sent in by component society secretaries and treasurers. His report was accepted.

Assessment

Clarification of the assessment was asked and after discussion, upon motion of Dr. Bohrer, it was voted that honor members, junior members and men in the armed forces be excused from the payment of the assessment.

Advisory Committee to S.S.S.

Dr. Mueller gave a brief report on the work of the Advisory Committee to the Selective Service System and said he was available to answer questions of individual Councilors.

Red Cross Blood Donor Center

Dr. Carl V. Moore, St. Louis, explained the desire of the St. Louis Regional Red Cross Blood Donor Center to furnish iron tablets to blood donors. He said that the Council of the St. Louis Medical Society had approved the plan and wished permission of the Council to secure permission of county medical societies to carry out the plan in the state. He said the plan was used during World War II and was inaugurated because some donors cannot repeat donations because of lowered hemoglobin. Upon motion of Dr. Thompson, approval was given the plan.

Blood for Korea Day

A letter from the New York State Medical Society enclosing the following resolution was read:

"WHEREAS, There is a need for whole blood for our Armed Forces in Korea; therefore, be it hereby

"*Resolved,* That each county medical society in New York State designate a day in the near future to be called 'Blood for Korea Day'; and be it

"*Resolved,* That on that day the members of the component county medical societies be called upon to donate a pint of blood to the Red Cross; and be it further

"*Resolved,* That other state medical societies be advised of this action, and invited to join in this demonstration of the desire of the medical profession to help our nation, our people, and our Armed Forces."

Dr. Moore's opinion was asked concerning the resolution of the New York State Medical Society. Dr. Moore felt that it would be a good influence but pointed out that it would not be guaranteed that blood given would go to Korea, that other demands had to be met as well. It was suggested that "Blood for Defense Day" be used. Upon motion of Dr. Thompson, it was voted to approve a program of blood donor recruitment, with matters of publicity in cooperation with the Red Cross, with Regional Centers taking the lead and each county medical society adopting its own plan of procedure.

Report of Field Secretary

Mr. McIntyre reviewed the postgraduate work that had been done since the last Council session. He reported on several allied meetings including the Missouri Health Council, the Missouri Academy of General Practice, the Missouri Social Welfare Society and a Conference on Children and Health.

State Fair Exhibit

Mr. McIntyre reported that the A. M. A. would furnish an exhibit for the Missouri State Fair again

this year. He said also that Dr. Hungate had asked about sponsoring an exhibit on Civilian Defense at the Fair, and upon checking costs it would be near a thousand dollars. After discussion in which it was brought out that the medical phase was only one part of Civilian Defense and that state agencies should take the principal responsibility of such an exhibit, upon motion of Dr. Francka, it was voted that the Association assume obligation up to $100 toward the exhibit.

Care of the Indigent

Mr. McIntyre reported that a conference had been called by the Missouri Health Council for September 19 at Jefferson City for discussion of the problems of general medical, hospital and dental care of the indigent. The conference will consist of formal presentations in the morning and a general discussion group in the afternoon. This led to a discussion of the relief rolls of the state and the part medicine can or should play. It was decided that there should be good medical representation at the conference.

Fall Meetings

Mr. McIntyre said that the Missouri Academy of General Practice would hoid a series of meetings this fall, similar to those of last year, and that these would be arranged so as not to conflict with Councilor District meetings.

Councilor District Meetings

Mr. McIntyre asked the opinion of the Council on Sunday Councilor District meetings, the possibility of wet clinics and clinical pathologic conferences. Opinion was divided and it was left to Mr. McIntyre to work out with individual Councilors.

Committee on Rural Medical Service

Dr. Kennedy explained the new committee on Rural Medical Service of which Dr. A. E. Spelman, Smithville, is Chairman. He said there would be a meeting, probably on July 14 and 15, at which the Committee would discuss the possibilities and scope of its work, considering Health Councils, number of physicians in rural Missouri, the new law concerning county health centers and Blue Cross and Blue Shield in rural Missouri.

Fund for Medical Education

Mr. O'Brien presented material from the A. M. A. concerning the American Medical Education Foundation and the newly established Fund for Medical Education including a letter from Dr. Donald G. Anderson urging state associations to encourage members to support the fund. After discussion of medical education and its problems of financing, upon motion of Dr. Petersen, it was voted that the Council recommend to its members through the Journal that they support the fund.

Minnesota Plan of Approving Insurance Companies

Mr. O'Brien presented material on a plan of the Minnesota Association on approving insurance plans for prepayment of medical, hospital and surgical care. The Association appointed a committee of nine physicians and three insurance men to work out a questionnaire, minimum requirements and schedule of fees for presentation to insurance companies, asking them to submit any policy they had which met with the minimum requirements set up by the committee. This material will be made available to members. The material has just gone to insurance companies and it was decided to wait for further information from Minnesota before any action is taken.

Conference for Improvement of Care of Patient

Dr. Paul N. Johnstone, Kansas City, reported on the Conference for the Improvement of the Care of the Patient. The conference, composed of representatives from the medical, hospital and nursing fields, has had four meetings at which trends of these fields have been discussed and watched. It was pointed out that this is merely a discussion group but that the interchange of thoughts is important. At the request of Dr. Johnstone and on motion of Dr. Francka, it was voted to approve the conference in principle and to appropriate $100 toward the necessary expenses of the conference.

Report of Editor

Dr. R. O. Muether, St. Louis, Editor, outlined the purposes of The Journal as presenting original articles of general interest, reviews on specific medical subjects, organization and economic information, special articles which have teaching value and editorials, both scientific and organizational and economic. He asked the opinion of the Council on publishing controversial material, probably as correspondence so that The Journal took no responsibility for the opinions expressed. The possibility of making space available in The Journal for material from allied groups, as the Woman's Auxiliary, Medical Technicians, and Division of Health, was discussed. On motion of Dr. Dowell, The Journal was approved as it is now published. On motion of Dr. Bohrer, the Editorial Board was given authority to incorporate new features at its discretion. Dr. Virden told Dr. Muether that the Committee on Emergency Medical Service would like to have a report in one issue of The Journal to be used as a reference. Dr. Muether said this would be done, depending on the amount of the material and the possibility of doing it.

Committee Appointments

Dr. Virden made the following committee appointments which were approved by the Council:

Committee on Alcoholism: Ralph E. Duncan, Kansas City, Chairman; S. D. Smith, Columbia; Kenneth Coffelt, Springfield; Joseph B. Kendis, St. Louis; George W. Forman, St. Joseph.

Committee on Hospitals and Professional Relations: Paul Johnstone, Kansas City, Chairman; Joseph L. Fisher, St. Joseph; C. G. Stauffacher, Sedalia; Stanley S. Peterson, Springfield; Hollis Allen, St. Louis.

Committee on Public Policy and Public Relations: W. F. Francka, Hannibal, Chairman; J. W. Thompson, St. Louis; C. Edgar Virden, Kansas City; J. L. Washburn, Versailles; G. W. Winn, Boonville.

Committee on Anesthesiology: O. B. Crawford, Springfield.

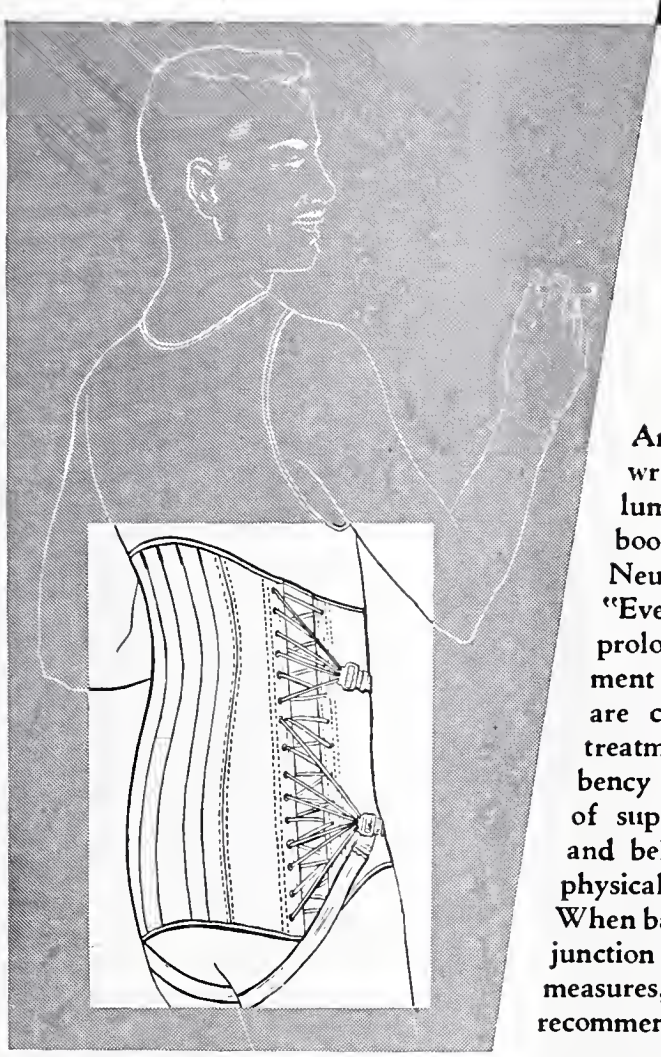
Report of A. M. A. Delegate

Dr. Schlueter reported briefly on the A. M. A. Session. He said that the fellowship dues of $5.00 would be abolished and that the amount of membership dues would be determined at the Interim Session.

Expenses of Executive Secretaries

The question of whether or not the expenses of executive secretaries of county medical societies in the

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**Philip Lewin, M.D., F.A.C.S.*
Backache and Sciatic Neuritis,
Chapter XXXIX, Page 580
Published 1943 by Lea & Febiger, Philadelphia

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state should be paid for attendance at Council meetings was discussed. On motion of Dr. Fries, it was voted that expenses of executive secretaries should be paid by county societies.

Four Year Medical School

Dr. Glenn Hendren attended the Council Session for a brief discussion of the situation concerning the four year medical school of the University of Missouri.

Place of Next Meeting

Dr. Petersen invited the Council to meet in St. Joseph for its next meeting and, on motion of Dr. Francka, this invitation was accepted.

Executive Session

On motion of Dr. Petersen, it was voted to allow time for an executive session of the Council on the next agenda.

Victor B. Buhler, M.D., Chairman

SOCIETY PROCEEDINGS

FIRST COUNCILOR DISTRICT

DONALD M. DOWELL, CHILLICOTHE, COUNCILOR

At the Strand Hotel in Chillicothe on Thursday night, June 28, twenty-five physicians and guests from nine adjoining counties in that area staged one of their frequent dinner meetings.

James R. McVay, M.D., Kansas City, Chairman of the Council on Medical Service of the American Medical Association, presented the scientific program. He spoke on "The Surgical Management of Common Rectal Disorders." This practical discussion was well illustrated with colorful slides.

The business part of the meeting was concerned with working out final details for the hyphenation of Caldwell-Livingston, Grundy-Daviess, Harrison, Lynn and Mercer counties medical societies. A committee of three was appointed to select a name for the new society and to write a constitution and by-laws.

Another meeting of the societies will be held in September to effect final organization of the proposed hyphenation.

The Grundy-Daviess County Medical Society was host for the meeting.

E. A. Duffy M.D., Secretary.

FOURTH COUNCILOR DISTRICT

JOHN O'CONNELL, OVERLAND, COUNCILOR

St. Louis County Medical Society

The annual spring dinner meeting of the St. Louis Medical Society was held at Belvedere Joe's on May 23, with W. H. Bailey, M.D., president, presiding.

Upon motion, the regular order of business was suspended and Dr. Bailey introduced guests and officers of the society. Members who received fifty year pins at the Kansas City session were introduced as follows: Drs. E. R. Brown, Otto W. Koch, F. L. Moore J. H. Walton. Drs. W. R. North, L. C. Obrock and E. E. Evans were not present.

Mr. Frank Eschen, of KSD-TV, spoke on "Special Events of Television."

Dr. Bailey announced that the annual picnic will be held at O'Connell's picnic grounds on September 16.

M. A. Diehr, M.D., Secretary.

NINTH COUNCILOR DISTRICT

E. C. BOHRER, WEST PLAINS, COUNCILOR

South Central Counties Medical Society

The South Central Counties Medical Society held a dinner meeting at the Presbyterian Church, Willow Springs, on May 16. Dr. T. J. Burns, Houston, called the meeting to order. Those present were Drs. E. C. Bohrer, Rollin H. Smith and C. F. Callihan, West Plains; C. W. Cooper, Thayer; A. T. Walker, Mammoth Springs, Ark.; T. J. Burns and S. G. Kramer, Houston; M. B. Perkins, Willow Springs; R. C. Nevin, Mountain View.

W. R. Beatie, M.D., Springfield, gave an interesting discussion on "Medicine Then and Now."

William F. Johnson, M.D., Springfield, spoke on "Comman Office Procedure in Urologic Practice."

Robert Maher, M.D., Springfield, discussed "Diagnostic Problems of General Surgery."

Mr. Gass of Blue Cross discussed the proposed raise in Blue Cross rates and requested doctors to explain the reasons to inquiring patients.

Meeting of June 20

The South Central Counties Medical Society met June 20 at the Arcade Hotel, West Plains, for dinner with the following present: Drs. R. W. Denney, H. G. Frame, S. W. Connor and A. C. Ames, Mountain Grove; S. G. Kramer, Houston; Rollin H. Smith and E. C. Bohrer, West Plains; C. W. Cooper, Thayer; E. R. Huffman and Jack Wiles, Springfield, and the wives of several of the men.

After dinner the ladies went to the home of Dr. Smith and the meeting was called to order by the vice president, Dr. Connor, in the office of Dr. Bohrer.

Dr. Huffman spoke on "Congestive Heart Failure and Its Treatment."

A. C. Ames, M.D., Secretary.

TENTH COUNCILOR DISTRICT

FRANK W. HALL, CAPE GIRARDEAU, COUNCILOR

Thirty-five physicians attended an evening dinner meeting of the Tenth Councilor District at the State Hospital, Farmington, Thursday night, May 31. The occasion began with a social hour with Mineral Area County Medical Society serving as host. A complimentary dinner was served at the Hospital through the courtesy of Dr. E. F. Hoctor, superintendent.

The scientific program was enthusiastically received and was as follows:

Edward F. Reinhard, M.D., St. Louis, spoke on "Recent Trends in the Treatment of the Leukemias."

Carl V. Moore, M.D., St. Louis, discussed "Recent Developments in the Management of Pernicious Anemia."

Frank W. Hall, M.D., Councilor.

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BOOK REVIEWS

Bacteriology, Textbook of, by Joseph M. Dougherty, A.B., M.A., Ph.D., Dean of the School of Science and Professor of Bacteriology, Villanova College; Fellow of the American Association for the Advancement of Science; and Anthony J. Lamberti, B.S., M.S., Instructor in Basteriology and Parasitology, Temple University School of Medicine; Formerly Instructor in Bacteriology, Villanova College; Member of the American Public Health Association. Second edition. With 141 illustrations. The C. V. Mosby Company, St. Louis. 1950. Price $5.75.

This book is intended to be used in institutions giving premedical, predental and pretechnologic instruction in bacteriology and allied subjects. There is an introduction by John A. Kolmer, who himself needs no introduction. He states that the book leaves to the graduate school the more exhaustive treatment common to so many textbooks in bacteriology. He believes that the clear approach which the authors use for the undergraduate is one of the chief merits of the work and that the more advanced students will be benefited by its lucid presentation of fundamentals, so necessary in preparation for higher studies. He calls attention to the novel diagrammatic presentation of Bordet and Gengou's original experiments on the complement fixation principle.

It is a book of 491 pages including the index. There are 141 illustrations. The chapter on the microscope and microscopy is well done. The usual setup of a book on bacteriology is given; namely, a discussion of yeasts and molds, apparatus used in the study of bacteria, culture media, fundamental culture and staining technic, bacterial types, bacterial variation, effects of physical and chemical agents of bacteria, chemotherapeutic agents such as salvarsan, sulfonamides, antibiotics. In another chapter on blood, the author discusses blood plasma, formed elements of blood, blood counting, total red count, total white count, origin of leukocyte, blood smears, staining of blood smears (Wright's stain), appearance of mature leukocytes when stained with Wright's stain, and the Arneth and Schilling indices.

I wish to criticize this all-too-brief discussion. Except the mere mention of the names, there is nothing in this discussion that would help anyone to understand it. I am rather dubious about the presentation of the problem of blood at all in a textbook on bacteriology. There is an excellent chapter on infection, one on immunity and one on hypersensitivity. The agglutinins, precipitins and the complement fixation and flocculation tests are well discussed. Various groups of bacteria are thoroughly set forth. Figure 117, which is a schematic representation of Treponema pallidum in tissue, should be eliminated and an actual microphotograph of this organism presented in future editions of this book.

I agree with John Kolmer in his views about this book, that it promises great help to premedic and predental students.

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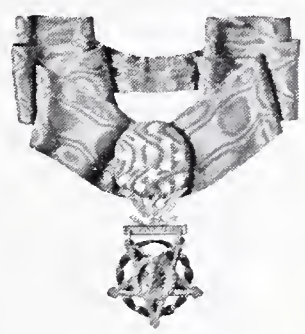
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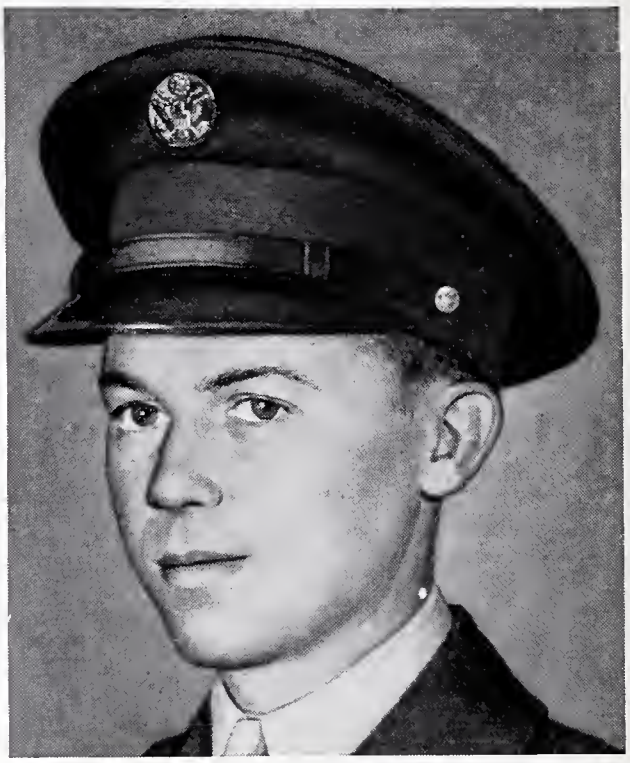
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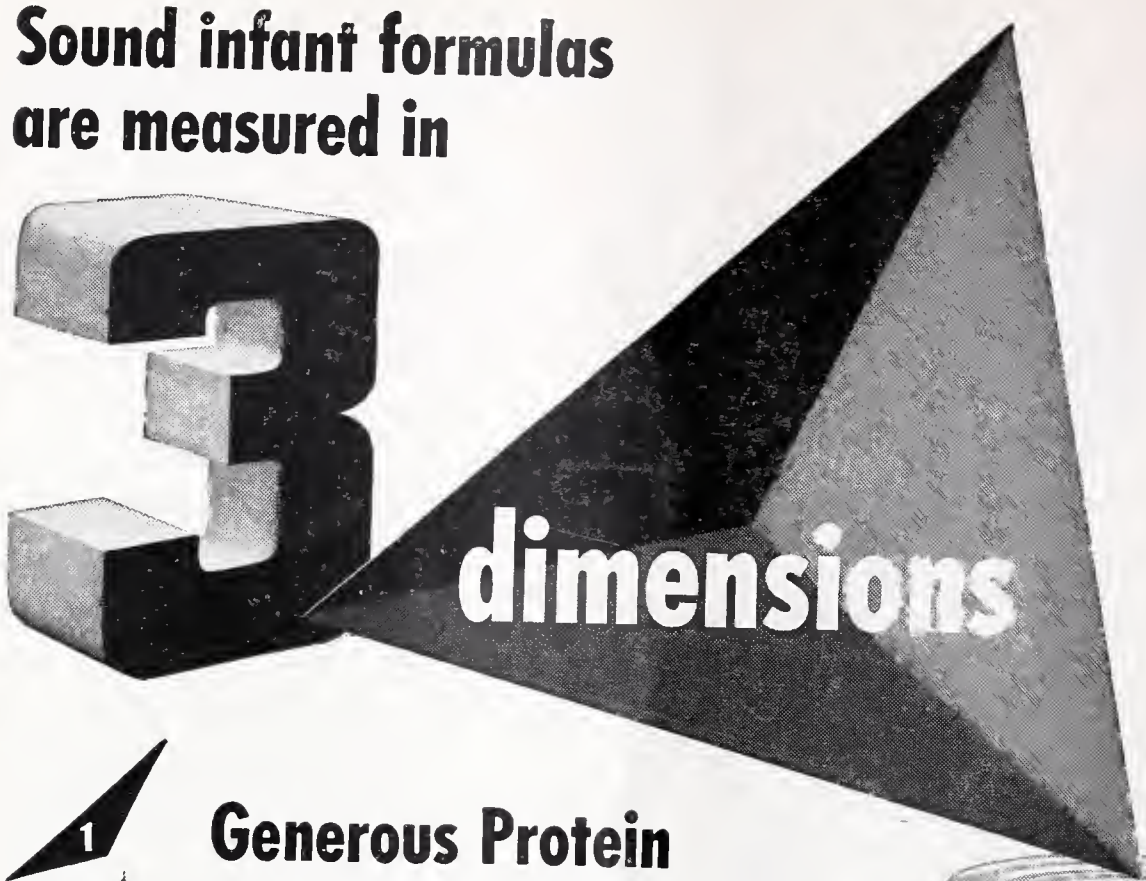


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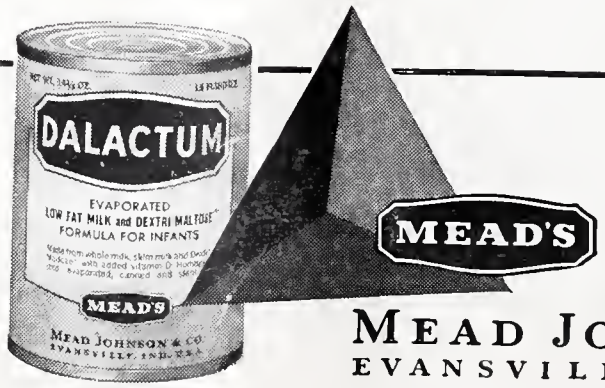
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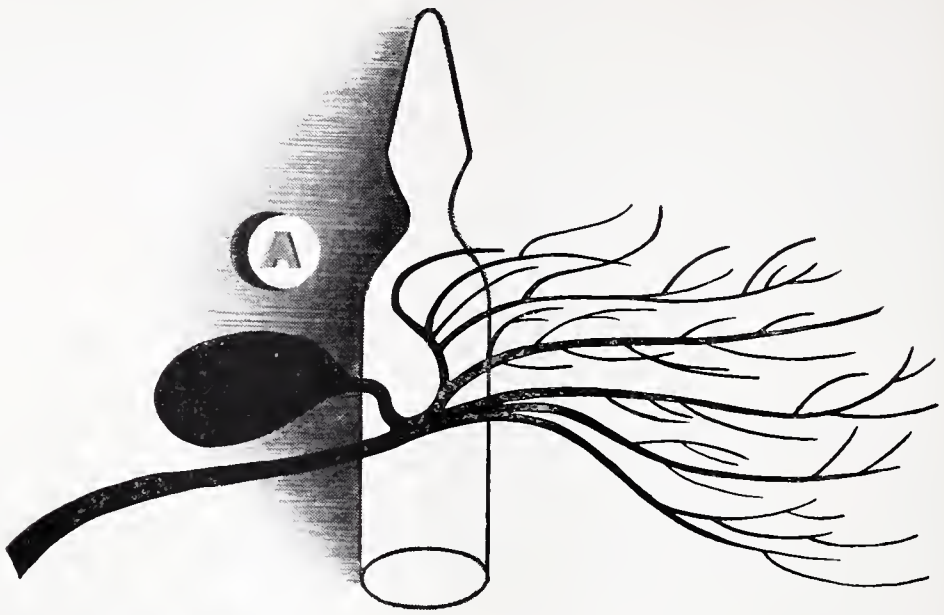
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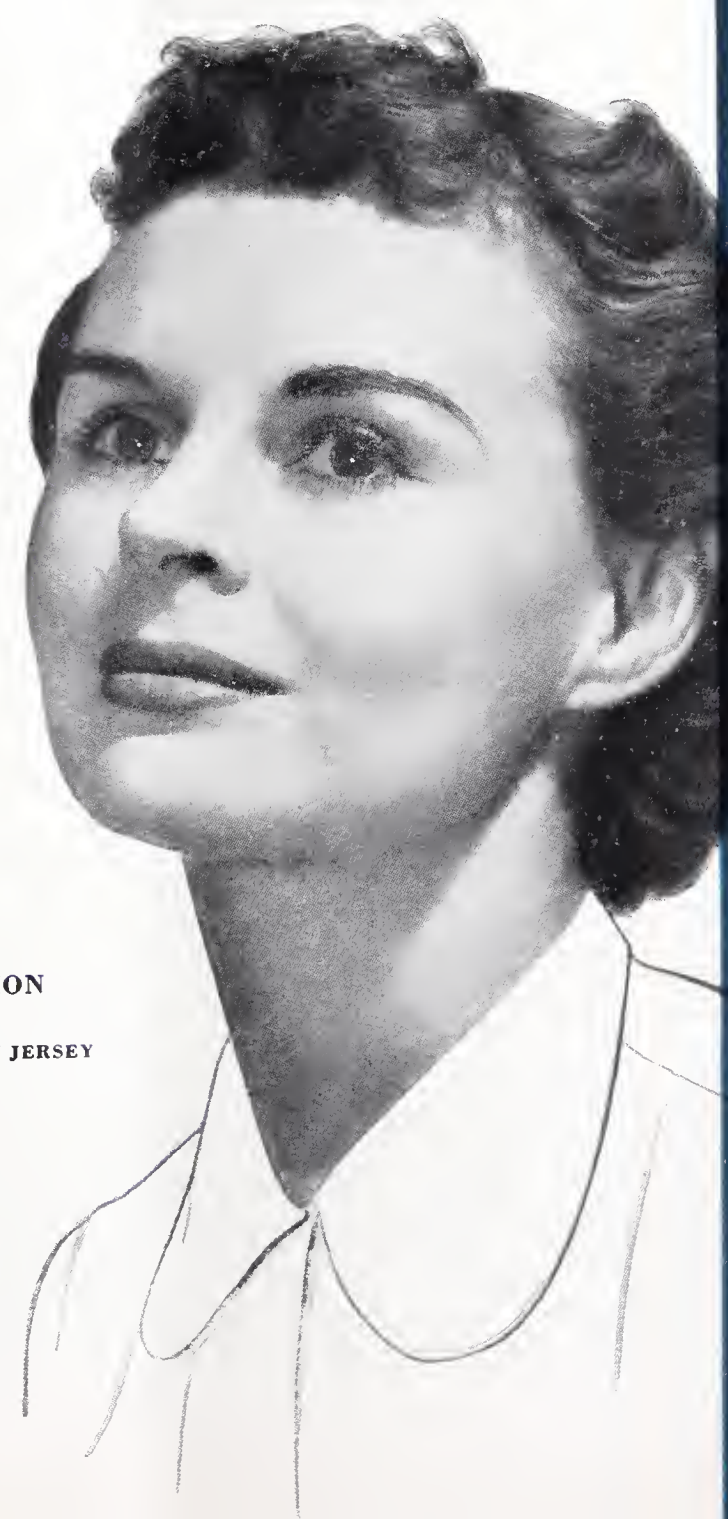
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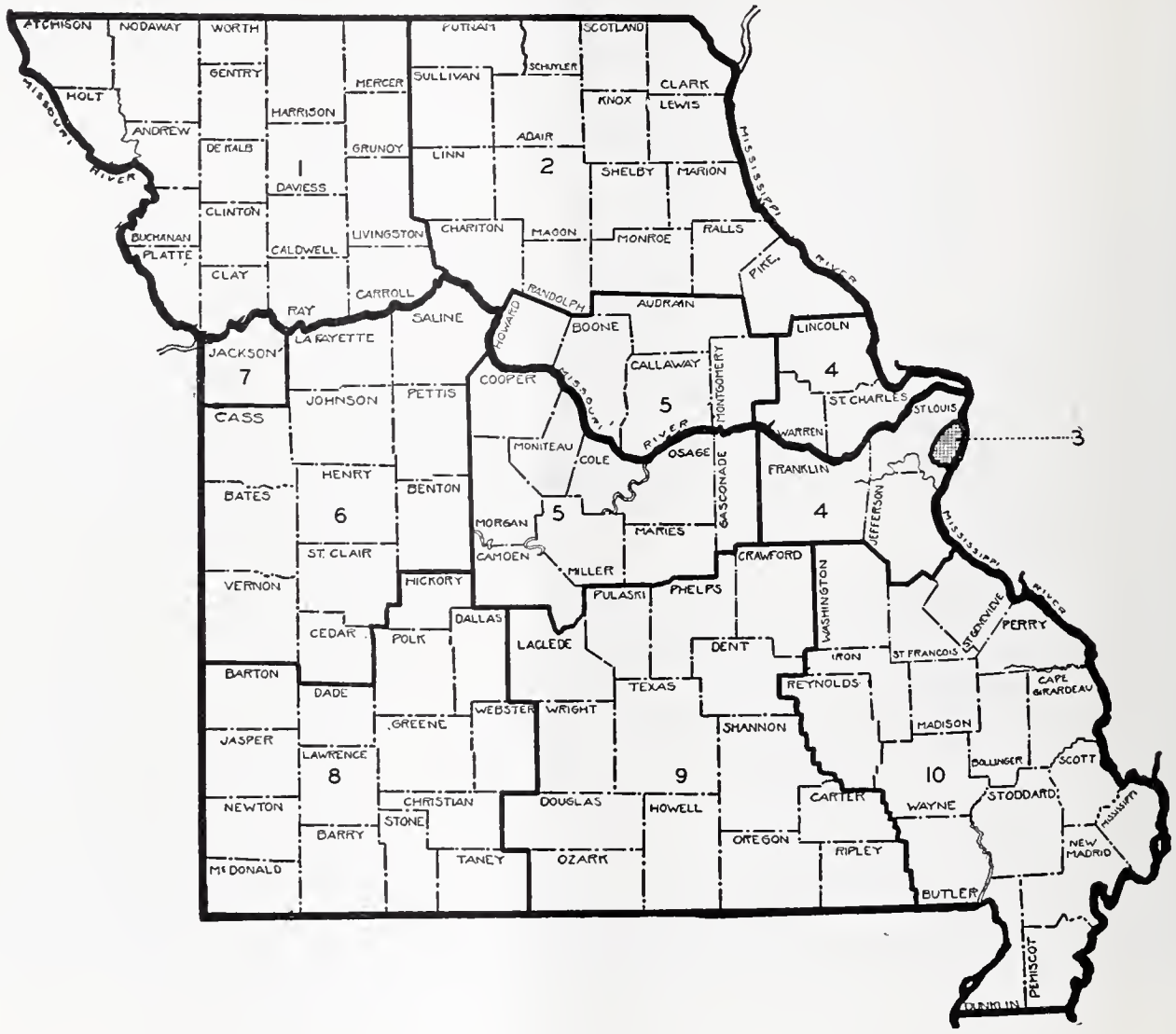
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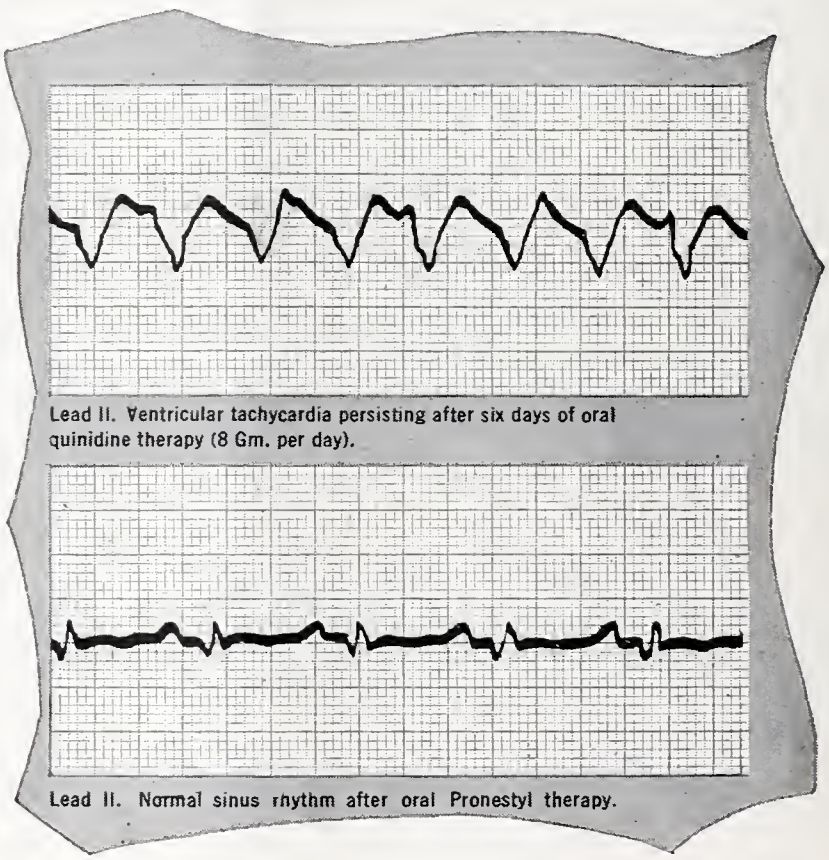
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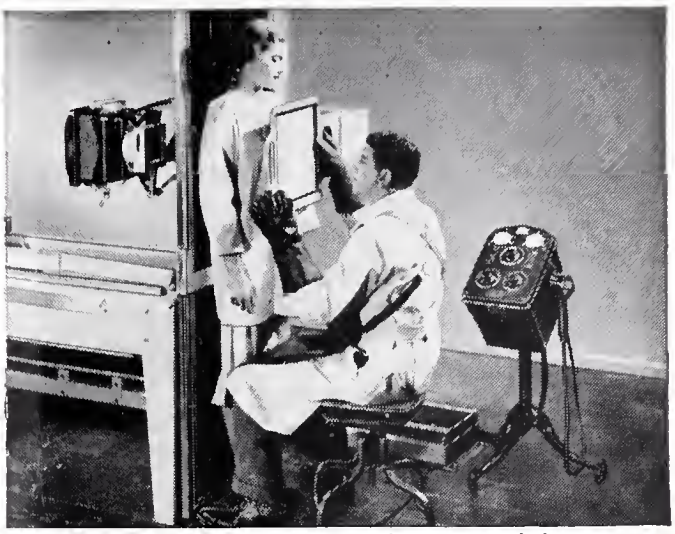
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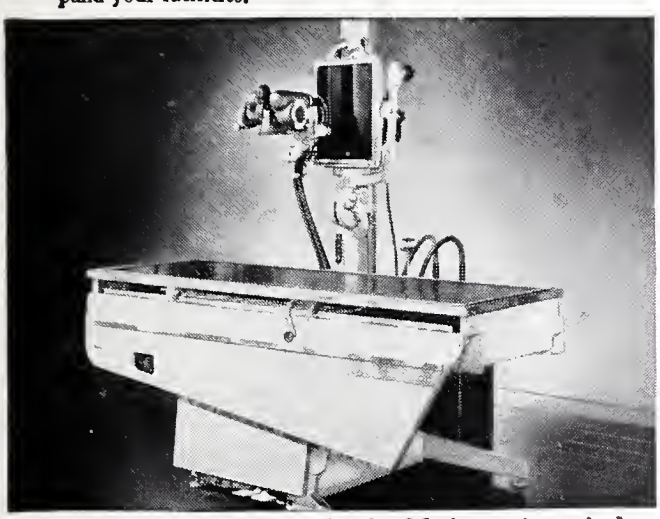
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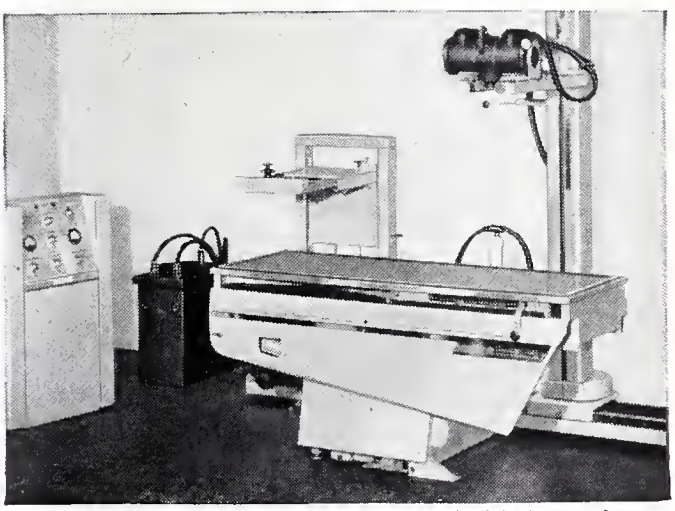
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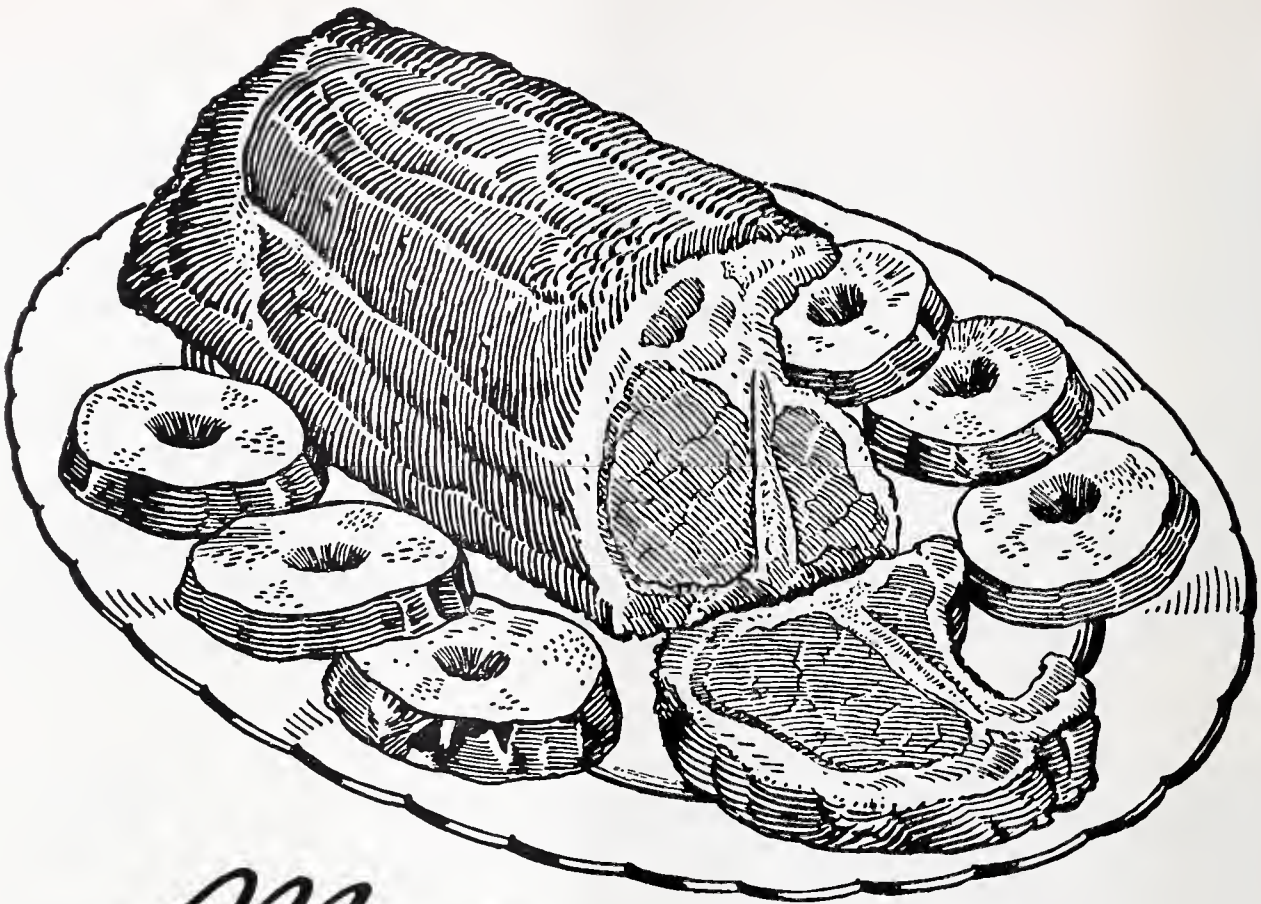
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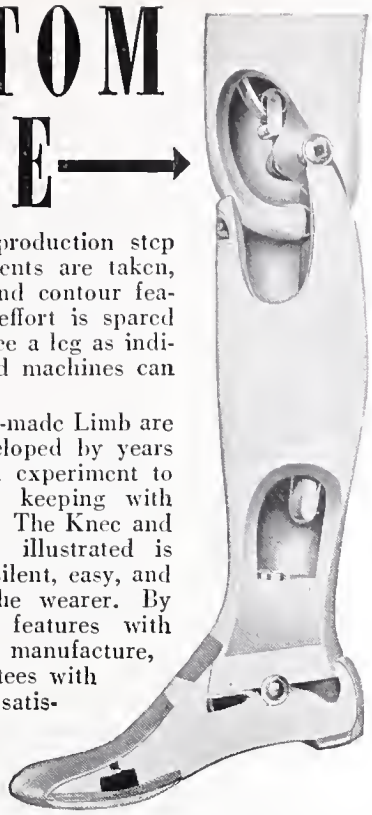
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*McLester, J. S.: Protein Comes Into Its Own, J.A.M.A. *139*:897 (Apr. 2,) 1949

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From where I sit *by* Joe Marsh

What's So Funny?

Just finished reading a magazine article that "proves" you and I don't know what's funny.

Some psychologists came to this sad conclusion after telling jokes to a group of college students. Very often they would give out with what they considered a side-splitter—and not get even a chuckle. Other times the students would laugh their heads off at stories that weren't considered really funny.

From where I sit, I fail to see what makes a psychologist a better judge of humor than the rest of us. If a man gets a kick out of a joke that proves it was funny to him—doesn't it?

When psychologists try to set up a standard for a sense of humor for people they're getting too darn serious for me. It's the same thing when other "authorities" try to tell a man how he should practice his profession, or what kind of beverage he can drink. I'm partial to a glass of beer with meals myself—but I promise not to make any wisecracks if you prefer tea.

Joe Marsh

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50 *and four*

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Scientific Articles

CLINICAL EVALUATION OF TROCINATE, AN ANTISPASMODIC

WILLIAM C. MACDONALD, M.D.
ST. LOUIS

THE CLINICAL evaluation of an antispasmodic presents many difficulties. The factors involved in producing the symptoms for which one generally uses antispasmodics are varied, and may in themselves respond to a number of different methods of treatment.

In the last three and a half years a synthetic antispasmodic, beta-diethylaminoethyldiphenylthioacetate hydrochloride has been used in a variety of functional gastrointestinal disorders. This drug, now produced commercially under the name of Trocinate,* is an ester of a thio-acid, whereas nearly all of the other synthetic antispasmodics are esters of carboxylic acid compounds.

The pharmacologic action of Trocinate was studied by Ramsey and Richardson.[1] They found the toxicity of the drug to be relatively low. Addition of it to a muscle bath of rat uterus reduced the muscle tone and amplitude of contractions. The effect upon intestinal motility in the anesthetized dog of 0.5 to 5 mg./kg. was partial or complete inhibition of intestinal movement, both that normally present and that induced by physostigmine. An interesting observation was of the effectiveness in checking senna induced diarrhea in mice.

During the period of study extending over the last three and a half years, there has been opportunity to observe the use of Trocinate in 110 cases of the irritable colon, in eight cases of functional intestinal hypermotility and in twelve cases of "heartburn" not associated with any demonstrable cause.

The dosage varied from 300 mg. to 1200 mg. daily. Best results were obtained with an average dose of 800 mg. daily. Each tablet contains 100 mg. and was usually given in divided doses of two tablets four times a day. Later in the study tablets were made available containing 65 mg. Trocinate with 15 mg. phenobarbital.

Of the 130 patients treated, symptomatic relief was obtained in 113. In the 110 cases of the irritable colon ninety-nine showed a satisfactory response, many with complete remission of symptoms. Some individuals relapsed after stopping the drug but showed remittance on starting it again. At the present time there are fourteen individuals who have been taking Trocinate more or less steady for thirty-five months with no ill effect.

Of the eight cases with functional intestinal hypermotility the response in five was dramatic with cessation of symptoms in forty-eight hours. Fluoroscopic recheck showed a more normal gastric emptying time and progression through the small intestine. The response in one was of slight improvement and there was little or no benefit in the remaining two cases.

"Heartburn," which is considered to be due to smooth muscle spasm, often constitutes a problem in treatment. Of twelve patients given Trocinate, there was distinct amelioration of symptoms in eight. A general diet was allowed and no other medication given.

Relief of symptoms was encountered in 113 of 130 patients treated. No side effects such as mydriasis, dryness of the mouth, vertigo or nausea occurred.

SUMMARY

1. The effect of a new antispasmodic drug, Trocinate, has been studied in a series of 130 patients with functional gastrointestinal disorders.
2. Improvement was noted in 113 of 130 patients.
3. The dosage varied from 300 to 1,200 mg. daily.
4. No side effects were encountered in any case.

CONCLUSIONS

A new, safe, antispasmodic drug, Trocinate, has been developed, which has proved to be of value

Department of Internal Medicine, Section of Gastroenterology, St. Louis University School of Medicine, and the Firmin Desloge University Hospital Gastrointestinal Clinic.
* Supplied by Wm. P. Poythress and Company, Inc., Richmond, Va.

in relieving smooth muscle spasm associated with functional gastrointestinal disorders.

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BIBLIOGRAPHY

1. Ramsey, H., and Richardson, A. G.: Studies on the Pharmacology of Beta-diethylaminoethyldiphenylthioacetate, a Synthetic Antispasmodic, J. Pharm. & Exper. Therap. 89: 131-142 (February) 1947.

HEAD INJURIES IN WAR

HENRY SCHWARTZ, M.D.,
ST. LOUIS

Unofficial reports from Korea indicate that among United States troops wounded by missiles, the ratio of neurosurgical casualties is one out of five. So high a casualty rate makes desirable the increased awareness of appropriate methods of treatment on the part of the battalion and forward group of surgeons, as well as those who are assigned to rear area hospitals.

In World War I, the operative mortality of penetrating head wounds ranged from 50 per cent early in the war to 28.8 per cent at the end. In World War II operative mortality was 14 per cent. On looking about for reasons for these improved results, factors such as improved evacuation, blood transfusions and chemotherapy have been cited by individual adherents. While none of these factors can be overlooked, there may be some tendency to overlook the most important element. Guns alone, with no one to shoot them, never won a war; so, in the treatment of the wounded, one must remember that the doctor handling that soldier is the deus ex machina of his death or salvation. In Churchill's report of results of war surgery, he says: "If the achievements of surgery (in the war) are ever judged noteworthy, they are attributable to the fact that experts rather than inexperienced surgeons (were) doing the work. All other measures were ancillary items."

Those who are expecting to go into service will receive a variety of appointments. The ways of the armed forces are at times difficult to fathom, and, by decree or order, pediatricians may find themselves in surgery, surgeons may be doing dermatology, and somebody will have to be Mess Officer. Whatever assignment may befall a medical officer, he is expected to be an "expert." Just how many will have to be concerned with head injuries I do not know, but on the basis of the relative number of head wounds being sustained in this war, and what may be expected at home in case of local bombing, I daresay that few doctors will not be troubled by these injuries.

Warfare has become so mechanized that one may expect not only large numbers of penetrating head wounds but also a considerable number of closed head injuries. The latter pose less of a problem in some respects, so I will review them briefly before going on to the major discussion.

One may classify head trauma in relation to the skull as noted. This is of no great significance in cases of closed injury but is of significance in compound or open injuries.

In any closed head injury, whether associated with fracture or not, one is concerned with damage to the cranial contents. This damage may involve nervous tissue itself, the intracranial vascular system or the cerebrospinal fluid system. Concussion is a physiologic rather than demonstrably pathologic condition which results from rapid deceleration of movement of the skull and continued acceleration of movement of the contained brain. Loss of consciousness may be brief or long, depending upon the severity of the injury. Contusion and laceration of the brain result from the same mechanism of acceleration and deceleration, resulting in either rupture of capillaries or actual tearing of brain tissue. Most head injuries resulting in concussion require no special treatment other than a period of rest. In this connection, it is of interest to note that, during the London blitz, early ambulation was practiced of necessity and the incidence of post-traumatic headache was negligible. It is of further interest to note that, after the emergency passed, the usual incidence of post-traumatic headache occurred.

Concussion, contusion and laceration of the brain may bring in its wake a certain amount of swelling. If swelling of the brain is not too great, then prolonged or dangerous symptoms do not appear. If, however, edema does not subside spontaneously or is not compensated for by direct attack or making room for swollen brain, signs of increased pressure occur. To counteract cerebral edema, limitation of fluids and the use of hypertonic solutions or the solution alone of 50 per cent glucose or sucrose is instituted. Spinal puncture is not recommended as a routine procedure to combat edema of the brain. Any patient with a head injury may develop an extradural hemorrhage or a subdural hematoma or hydroma. The classical picture of loss of consciousness, followed by a lucid interval, and then increasing drowsiness of the body, is familiar and I am sure that, given such a picture, one would proceed with immediate craniotomy and ligation of the middle meningeal artery. Subdural hematomas or hydromas may be suspected in a patient who does well for a while and then either fails to continue to improve or develops evidence of increased pressure; if, in

Presented at the voluntary course in Military Medicine and Surgery, Washington University School of Medicine, St. Louis.

In the late fall and early winter of 1950 a number of house officers were precipitously called to active duty with the armed forces. Some of them found themselves as combat medical officers at company level within three weeks after leaving the hospital. In order to prepare these men to some degree for their duties as company grade medical officers a short voluntary course in Military Medicine and Surgery was designed by the Postgraduate Division of the Washington University Medical School. This consisted of twelve lectures given by men who appreciated the problems of wartime military surgery from first hand experience. The lectures were designed to orient the young physician whose civilian training did not necessarily bring him in contact with the treatment of the injured patient.

In subsequent issues of The Journal will be published some of these lectures so that other physicians may benefit from this course. The implications of this information in case of civilian disaster are obvious.

addition, a dilated pupil appears, the diagnosis is fairly certain and evacuation of the subdural hematoma through a perforator opening is indicated. Since hematomas are commonly bilateral, openings should always be made on both sides.

The vascular complications of closed head injuries may also occur in open head injuries, particularly in the side away from the wound of entry. A bullet, for example, may go through the left parietal bone, lose speed as it reaches the calvarium on the right and flip over just beneath the inner table; a tear in a pial blood vessel might occur, with formation of a subdural hematoma.

HEAD WOUNDS

"The aim of treatment of head wounds, like that of wounds of other regions, is multiple: First, the prevention or eradication of infection in open wounds; second, the preservation of function, or the improvement of physiologic defects resulting from the injury; third, the restoration of anatomic structure as completely as possible." (Schwartz & Roulhac, Ann. Surg. 121:129, 1945).

Under ideal conditions, if a wounded man can reach an installation which is well equipped and well staffed, within a short period of time, the realization of all three of the foregoing aims may be expected. Such conditions are not always possible under conditions of war, and the methods of treatment and trains of thought which I submit are the result of necessary revisions and modifications acquired by experience in the last war.

At the time of our entry into the last war, it was accepted that the "golden period" for definitive surgery was about twelve hours. It was believed that after this lapse of time, closure was too hazardous and that radical surgery should give way to acceptance of inevitable infection, with complicating meningitis, cerebral fungus or abscess formation; all resulting in high morbidity and mortality rates.

Faced with difficulties of terrain and transportation in Africa, this time interval was exceeded more often than it was met. With misplaced faith in sulfonamides, it was thought that infection might be held in abeyance. It soon became apparent that, with incomplete surgery, the addition of sulfonamide had no effect in preventing serious infection nor did it help healing. In a relatively small number of cases in Africa, it was found that a rigid time limit could be ignored. Our first faltering steps in this direction grew out of fortuitous experience early in Africa with cases such as the following: A 29 year old soldier suffered a mortar shell fragment wound of the left parieto-occipital region. On the day of injury, the wound was "debrided" at a Surgical Hospital, sulfanilamide was placed in the wound and the galea and skin were closed. By the time he got back to the hospital, fifteen days later, he had papilledema and the wound was partially broken down. Skull films showed multiple indriven retained bone fragments. Secondary operation was performed with removal of necrotic brain, bits of hair and bone fragments; several bone chips with accompanying hair were found to have perforated the ventricle. Faced with an open ventricle, drainage of such a wound would have courted disaster and it was therefore decided to risk tight closure. The patient received sulfadiazine by mouth postoperatively. The wound healed promptly.

As time went on, conception of a sharply limited time interval was replaced by increasing reliance upon radical surgery. Soon it became common to attack late wounds with the same precise surgical methods that always applied in early cases. The principle of delayed debridement became crystallized, as it became increasingly obvious that early, but incomplete, surgery was more dangerous than none. The results were so satisfactory that it was concluded that, when complete surgery was not possible in the forward area, it was best for the patient to be transported to the rear, even if this meant considerable delay.

Patients with head wounds, who may be expected to survive, tolerate transportation quite well. So far as immediate treatment goes, for example in the Battalion Aid Station, all that is required is to clip or shave the hair surrounding the wound and the application of a snug dry dressing. Local sulfonamide is of no value. No attempt should be made to "debride" the wound unless facilities for complete and thorough surgery are available. "Packing" of the wound with vaseline gauze is to be condemned. If the patient is conscious and not nauseated, sulfadiazine should be given by mouth and penicillin given parenterally. Patients with limited head wounds are not usually in shock but if this is present treatment for shock should be instituted before anything further is done. Morphine should not be given. The only exceptions to this rule-of-thumb are some patients with associated compound fractures of the extremities. If morphine is given, it should be noted carefully and the patient's respirations should be checked frequently. Unconscious patients should be kept with the head on the side to prevent aspiration of secretions or vomitus. Wherever possible, a brief note of the neurologic status of the patient should accompany him to the hospital where definitive surgery is to be carried out. This does not mean a detailed neurologic examination but should include vital signs (particularly pulse and respirations), state of consciousness, reaction and equality of the pupils and presence or absence of paralysis. Changes in these signs may be of great importance in discovering a hematoma or in instituting prompt measures to combat increasing intracranial pressure.

After the wounded man reaches an installation where adequate facilities exist for definitive surgery, the wound is treated along fundamental principles in both early and late cases. For a wound which involves scalp, bone, dura and brain, a combination of methods described under each section is carried out.

SCALP

Even minor wounds of the scalp should be examined carefully so as not to overlook underlying fracture or penetration of the brain. X-ray examination is of inestimable value in all head wounds. There have been numerous cases in which a tiny penetrating wound of the scalp has been overlooked and found to be crusted over when subsequent meningitis or abscess revealed that this represented the portal of entry of a small metallic foreign body into the brain. Whether there has been penetration of the skull or not, treatment of the scalp wound is the same. Skin and galea should be excised minimally. If enlargement of the wound is needed, incision should be planned so that both exposure of the underlying tissue and closure of the scalp may be facilitated. Elliptical, minimal excision of skin edges, with linear or slightly curved extensions, are the best methods. Tripod or multi-limbed; *e.g.*, Isle of Man, incisions are not recommended. It is true that if the tripod junction is correctly closed, without tension, breakdown will not occur. However, it should be borne in mind that in many cases, the scalp defect is great and the avoidance of tension throughout the suture line may be difficult. It is recommended that curved incisions be made at either end of the excised wound. In most cases, by undermining the scalp, satisfactory closure without sharp angles can be achieved by this method. Where loss of skin has been great, a rotation flap can be fashioned and advanced to effect closure without tension. The pericranium of the donor area can be covered with a graft either at the same sitting or after a few days. If a simple relaxing incision is used, it should be placed several inches from the wound to preserve blood supply.

A horseshoe scalp incision with the entry wound in its center is advised against except in special instances. There is nothing against the procedure if further trouble is not anticipated, and if the base of the horseshoe is wide enough. As a matter of fact it might be desirable from the point of view of subsequent plastic repair of the skull. Against its routine use, however, is the fact that there are infected cases in which secondary surgery was necessary after the original operation. In such cases, there is usually a zone of infection or necrosis about the central entry wound which requires wide excision; under such circumstances, viability of the periphery of the horseshoe is jeopardized.

The scalp preferably is closed in two layers with fine silk or cotton, without drainage.

In cases with avulsion of the scalp, every effort must be made to cover bare bone. Where this has not been done necrosis of the outer table occurs and, even if infection does not supervene, healing is protracted. In such cases, if seen within four or five days, swinging a skin flap to cover the denuded area without getting slough of bone has been done. In other instances, the outer table has been chiseled away or drilled, thus permitting growth of granulation tissue which can be covered with a graft.

In late cases, *i.e.*, two days or longer, the edges of the scalp wound usually are found to be macerated, edematous and may be frankly infected. Thus much wider excision of skin is required and closure is even more difficult. If there is no other reason for urgency, these cases usually are treated with wet dressings of fine mesh gauze for twenty-four hours prior to surgery.

The importance of closure of the scalp is so important that this phase of the problem has even influenced the choice of anesthetic.

In large defects, where every millimeter of skin is significant, local anesthesia has not been used. The wheal raised by infiltration around a large defect takes up precious skin that might be used to effect closure; also the blood supply at an already questionably tense suture line may be diminished by the surrounding wheal of anesthetic agent. Closure of a large defect may also require much time (sometimes more than the rest of the operation itself), and in my experience restlessness of a patient with a bad head wound can be quite trying. Endotracheal anesthesia is better than pentothal for long procedures.

After scalp closure, the wound is covered with dry fine mesh gauze and the head encased in a snug firm dressing. Vaseline gauze should not be used. It has been my impression that wounds which are sutured with any tension at all may become macerated when covered with a greasy dressing and hence less resistant to infection.

BONE

In cases of glancing, lacerating scalp wounds one may find the pericranium intact or partially torn. Pericranial excision of contained bits of dirt is essential. Beneath damaged pericranium may be found a small area of discolored "bruise" bone, with no evidence of fracture. Unless there is clinical evidence of intracranial clot, excision is not necessary. However, in the subsequent course of the patient, the possibility of extradural abscess by direct extension from this site should be borne in mind. Where there is a linear fracture, particularly near the vertex, depression of the inner table should be suspected even if not demonstrable by x-ray. Having seen a case of infected extradural clot directly beneath an apparently superficial linear fracture, I have become loathe to accept the general idea of lightly dismissing such lesions. Debridement of the edges of the linear crack can be done quickly and easily with a gouge; if then there appears to be spreading lines of fracture beneath the narrowly debrided outer table, the full thickness of bone is removed and depressed inner table fragments are lifted out.

In cases of tangential wounds, there is frank depression and comminution of bone; the dura usually is penetrated, but may not be. All loose bone fragments are removed and bone edges

smoothed with rongeurs. Contrary to opinions held after the first World War, it was found unnecessary and unwise to create a flap and excise the fracture site en masse. It has been routine procedure to rongeur from the center until the defect is smoothed and until there is enough room to lift out large depressed and displaced fragments without risk of tearing a main venous sinus.

Where there has been a shallow perforating injury, with entry and exit wounds within one or two inches of each other, it has been found practical to rongeur away any remaining intervening bridge of bone (usually it will be elevated anyway by the force of the missile) and convert the two defects into a single large one. In these cases the underlying dura commonly is found to be blasted away over a considerable area and exposure is otherwise inadequate.

In late cases, slightly more extensive bone removal is necessary to be certain of getting beyond the limits of local contamination and, where dura is torn, to permit wider excision of dural margins. After a delay of several days, loose bits of bone which are attached to pericranium should be excised radically rather than risk incomplete removal of a potential focus of infection.

DURA

After debridement of depressed bone, if there is reason to suspect subdural clot, in early or in late cases, then, of course, intact dura should be opened and the clot evacuated.

There is some question as to the advisability of incising intact dura to examine the underlying brain. In the majority of cases, underlying cortex may be expected to be at least contused. The argument against opening the dura, unless specific indications exist, is twofold: first, it means crossing a natural barrier against infection; secondly, some believe that following dural incision, there may be increased damage to badly contused and partially pulpified cortex. I feel that removal of pulped cortex will result in less scar formation and perhaps diminish the incidence of post-traumatic convulsions. On several occasions it has been our experience to find superficial laceration of the brain with an underlying intracerebral clot of considerable size, following evacuation of which symptoms of increased pressure rapidly subsided. The risk of infection in early cases is so small that the advantages of opening the dura appear to outweigh the disadvantages. In cases seen after two or three days, the risk of infection is somewhat greater and unless there is evidence of pressure, incision of intact dura should not be done routinely. After this time interval, however, it should be pointed out that an original tear in the dura may have become sealed over, thus giving the surgeon a false sense of security. It has been my unhappy experience to miss a large cerebral abscess through this error of thinking. Here again, x-rays can be of inestimable value if an intracranial sliver of bone or metal is demonstrated.

After removal of superficial bone fragments, the dura usually will be found to be torn open. In tangential wounds, the dural defect often will be found to be amazingly extensive. It is necessary to rongeur away bone edges to uncover the periphery of the dural defect. Dural margins are narrowly trimmed and, after debridement, the dural tear is closed tightly with fine silk sutures. In cases in which there is relatively little loss of substance, a patch of pericranium is adequate for water tight closure. Where there has been greater loss of substance, fascial graft taken from the temporal muscle (if in the operative field) or from fascia lata of the thigh is preferable. I have used fibrin film but have not found it to yield a water tight closure, which is particularly desirable in cases of ventricular communication or communication with air sinuses.

The use of preserved cadaver dural tissue does not have enough in its favor to justify its use. Chemically preserved tissue probably increases proliferation of scar tissue. In cases in which speed is so vital that the use of preserved graft is considered against the few moments required to obtain a fascia lata transplant, then I believe that the patient's condition would not justify even the time consumed to effect dural suture. After the dura is closed and hemostasis is effected, the scalp is sutured in the usual way, without drainage.

In late cases, where there is underlying gross contamination or infection of the brain, it was the original opinion while in Africa that dural closure with a graft was too hazardous a procedure. Subsequently, with increasing experience with delayed debridement, opinion has been modified. We have performed such closure in the presence of infection, particularly in cases with free ventricular communication, and have had some excellent results. With the increasing use of penicillin locally and parenterally, dural grafts in late cases may be expected to be generally successful. Treatment of the dura in wounds which communicate with air sinuses, or in which large venous sinuses are involved, will be considered in separate sections later.

BRAIN

In most penetrating wounds of the brain which are of moderate or great severity, brain damage is recognized readily on superficial inspection alone, with pulped or herniated cerebral tissue protruding through the skin defect. In some cases, however, cursory inspection of the wound may lead one to the erroneous assumption that only a superficial scalp or bone wound has been incurred.

X-rays are of paramount importance in all cases, whether the severity of the injury is apparent or not, and, wherever possible, it is urged that stereoscopic views in two planes be made. The importance of complete removal of indriven bone fragments has been so significant that we have followed the policy of counting the number of fragments seen in x-ray films and the number

removed at operation, thus assuring ourselves of complete removal of offending fragments. Even so, difficulties are encountered when "nests" of fragments are visualized; here it may be impossible to visualize each closely placed fragment and one or more may be missed during debridement.

After removal of mushy, herniating brain protruding above the skin surface, and debridement of skin, skull and dura, the cerebral lesion is attacked directly. Dural edges are spread, or pliable metal retractors are placed within the existing dural defect. The mouth of the tract is cleaned with suction. Retractors are then placed progressively deeper, and, under direct vision, the tract of the missile (or bone fragments, is the case of tangential wounds) is sucked out thoroughly. Indriven bone fragments are removed either by being caught in the sucker or by forceps. In removing deep lying bone fragments in a narrow tract, due care must be taken to free the fragments from any large vessels that may be in the vicinity before lifting the fragment out; at times a main cerebral vascular trunk may be almost inextricably bound up in a nest of fragments, and considerable patience is required to free the vessel.

Every effort is made to remove all bone fragments; their retention has been found to be responsible for the development of serious infection later on. The tract is thoroughly debrided of all damaged and devitalized tissue with the bare suction tip, until healthy, viable brain is reached. As debridement with suction is carried out, customary control of bleeding with electrocautery, or clips, is necessary. Often the tract may extend into or through the ventricle, in which case the importance of complete hemostatis is vital. If the ventricle is penetrated, a clotted cast may be found within its wall; this must be evacuated and any bleeding points in the ventricular wall or choroid plexus must be arrested.

Not infrequently, the course of the missile is found to have traversed beyond the ventricle, or through the falx to the opposite hemisphere. The stream of indriven bone chips usually will end at a considerable distance proximally, and beyond this point the missile tract will become difficult to follow. When this stage of debridement is reached, further extended search for a metallic foreign body along a dwindling tract is not indicated. There are times, however, when the missile in its subsequent course lacerates a large vessel and a deep intracerebral clot results. In such instances, it may be necessary to attack the hematoma from another approach, either on the same or opposite side of the brain. However, I have been amazed at times, in such cases, to find how far one can explore along a long tract, particularly if a moderate sized hole exists in the falx.

In perforating wounds, debridement of the entry and exist tracts is essential. Not infrequently, in these cases, a sizeable hematoma is found along the exit tract, and this may exert much more increased intracranial pressure than the wound on the entry side of the head which contains less blood and almost all the indriven bone fragments.

Heroic efforts to remove metallic foreign bodies are not indicated and, unless they are readily accessible or are of large size, do not demand removal anywhere near as much as do bone fragments. Metallic objects do not commonly act as a nidus for infection. However, they are by no means innocuous in this regard. I have seen one case of a penetrating wound of the frontotemporal region in which the tract coursed through the temporal horn of the ventricle and the foreign body lodged in the occipital lobe. In the temporal lobe portion of the tract, retained bone fragments were found to be associated with a staphylococcus abscess; the occipital lobe metallic body was associated with a clostridial abscess. Other cases of infection associated with retained metal have been seen, but the frequency is relatively far less than that encountered with retained bone fragments.

After complete hemostasis and debridement of the brain, the dura and scalp are closed without drainage, as described in the foregoing sections.

In late cases, demarcation of the tract of damaged, devitalized tissue is quite sharp and, from the technical point of view, surgery is if anything less difficult than in the first few hours after wounding. Soft, necrotic material is removed readily with suction and the limits of healthy brain are easily recognized. Since the involved area is grossly contaminated at this stage, thoroughness of debridement cannot be overemphasized if one expects to effect tight closure without continuing infection.

After about three days following injury in an untreated or incompletely debrided wound, the tract itself shows gross morphologic changes. The periphery of the dura is bound down to the surface of the tract and the mouth of the tract is lined with tough fibroblastic tissue. The latter appears to grow down into the walls of the tract from the overlying meninges. In most cases this fibroblastic tissue acts almost like a collar, extending about 1 to 2 cms. beneath the surface. From this point, the tract balloons out like the body of a bottle, and gross fibrous line of demarcation no longer exists between pulped brain and surrounding viable tissue.

I have seen this same "bottleneck" appearance as late as two weeks after injury. In some cases, however, as early as the eighth day, fibroblastic proliferation has proceeded rapidly with the result that the entire tract is lined with a shaggy, tough wall, not unlike the encapsulation which we had become accustomed to hope for in cases of "civilian," hematogenic brain abscesses.

Where the "encapsulation" is found to be limited to the superficial portion of the tract, we have felt that following careful debridement with suction, tight closure should be effected in layers. On the other hand, where the entire tract was well lined, the analogy between it and the "civilian" type of abscess was so striking that it was our

policy at first to treat them as such, by open drainage and marsupialization. As time passed, however, we became more bold and more certain of the effectiveness of debridement even in a shaggy walled cavity, and toward the last half of the Italian campaign, even these cases were closed tightly. In carrying out debridement in such wounds, it is imperative that the wall be gone over with the sucker, millimeter by millimeter, and all grey, shaggy exudate be removed, revealing healthy looking pink granulation tissue.

WOUNDS INVOLVING AIR AND VENOUS SINUSES

A large percentage of wounds about the eyes and face are found to penetrate the brain, and here again careful x-ray studies are invaluable. The appearance of indriven bone fragments or metallic foreign bodies within the cranial vault presupposes a tear in the dura. With wounds coursing through the orbit, frontal or ethmoid sinuses, or root of the nose, free persistent communication between the subarachnoid space and the outside environment must be avoided at all costs.

In these cases, unless the wound of entry is large enough to permit of adequate intracranial exploration, we have usually reflected a frontal bone flap over the involved side; if both sides are involved, bilateral exploration is demanded. After reflection of the flap, superficial debridement is first carried out extradurally, if the wound is high. If the wound is low, *i.e.,* through the orbit or even closer to the base, the dura is opened and debridement of dura and brain is performed. The difference between the lesion of war and that of civil life (due to blunt injury) is noteworthy. The dura is found to have suffered considerable loss of substance in almost all cases of penetrating wounds, and a wide defect may extend from the cribriform plate to the optic chiasm. After cerebral debridement, the surgeon's ingenuity may be taxed to the limit to effect water tight dural closure. There usually has been so much loss of dura that transplant of pericranium (for small defects) or fascia is necessary to bridge the gap. The tear in the dura may extend so far back that placing of sutures, even with fine needles, is practically impossible. "Classical" methods for dural closure are not always applicable. This is particularly true when the defect is in the neighborhood of the chiasm. In such cases, we have anchored the fascial graft as far as possible and have achieved water tight closure at the depths of the defect with a plug of muscle secured by a sling type of stitch brought out extradurally.

Once dural closure is effected, following complete cerebral debridement, the surgeon can feel reasonably certain that meningitis will not occur.

So far as the air sinuses themselves are concerned, we have cleaned them out as far as possible, removing all fragmented bits of bone, smoothing out the ragged edges with rongeurs and curetting the mucous membrane. To promote escape of blood between dura and frontal sinuses, we used to bring a rubber dam drain out through the nose for twenty-four hours. However, we gave this up as unnecessary, after further experience, and have closed the wounds tightly without drainage. For the first few days, patients must be prevented from blowing their noses. No instrumentation of the sinuses through the nose is indicated or desirable.

Bone fragments or metallic foreign bodies which lie adjacent to or which penetrate a large intracranial venous sinus have always deserved whole hearted respect and fear. Before attempting to dislodge the offending object, it is essential that effective control of the sinus be obtained. In many cases of longitudinal or lateral sinus penetration, suture of the wall can be performed without too much difficulty. Where the defect is large, however, plugging the hole with a muscle stamp is effective; or ligation proximally and distally can be done. It is wise to rongeur away enough bone on either side to permit of ligation if necessary before removal of the fragment. Extensive bone removal over the involved venous channel may not be necessary with recently developed hemostatic agents. Penetrating fragments can now be lifted out from the wall of the sinus, with relative impunity, and bleeding can be arrested promptly and securely by direct application of fibrin foam or hemopax.

CHEMOTHERAPY

I do not believe that local application of the sulfonamides is of value in the definitive treatment of penetrating wounds of the brain.

Our experiences with sulfadiazine have been such that we still recommend it to prevent and cure meningitis secondary to wounds of the head. For this purpose, it is usually given intravenously in two divided doses of 3 grams each in the first twelve hours, and then orally (if patient can swallow) in doses of 1 gram every four hours. In the ordinary case, unless infection supervenes or continues after surgery, dosage is decreased after five days, and the drug is discontinued in from seven to fourteen days.

Penicillin, parenterally, locally, intrathecally and intraventricularly is of great value. It shoud be given parenterally in all cases. In late cases, local instillation of 20,000 units is worth while. Where there is evidence of meningitis or ventriculitis, we have not hesitated to give doses up to 50,000 units intrathecally or intraventricularly. Despite reports of harmful irritating effects when applied to the cortex or ventricle, we have not seen any untoward effects and feel that adequate dosage in the presence of severe infection is indicated.

Streptomycin may also be used along with penicillin by the same routes.

Reliance upon chemotherapy to prevent infec-

tion, to the exclusion of radical thorough debridement, will inevitably lead to disappointment. The experiences of the last war have demonstrated conclusively that, in penetrating wounds of the head, primary emphasis should be placed upon complete, definitive surgery, with drugs and antibiotics as valuable adjuncts to fortify surgical technic.

SUMMARY

1. Policies and methods of treatment of head wounds are presented.

2. Emphasis has been placed upon radical debridement, with closure of wounds, in both early and late cases.

3. Chemotherapy, in the form of sulfadiazine, penicillin and streptomycin, has been used as an adjunct to surgery.

4. Although early treatment is desirable, it has been found that even in cases which receive definitive therapy late, infection is not inevitable.

5. X-ray examination of the head is highly desirable in all cases; not only in frank head wounds, but in wounds of the eyes and face as well. With adequate x-ray films, the existence of indriven bone fragments and metallic foreign bodies is demonstrated, thus resulting in better planned surgery.

6. Debridement of the scalp consists of minimal excision, with linear or curved extensions of the original wound. Tripod or multiple radiating incisions are not recommended. Every effort should be made to effect scalp closure without tension. The problem of closure of a large scalp defect may require as much time as the rest of the operation.

7. Endotracheal general anesthesia has been found most satisfactory, in the hands of a qualified anesthetist.

8. It has been customary to effect dural closure in most cases. Where there has been loss of dural substance, transplants of pericranium, temporal fascia or fascia lata have been used. The use of preserved cadaver dura grafts is not recommended. In wounds communicating with the air sinuses, dural closure is imperative.

9. Every effort is made to remove all indriven bone fragments. Retention of bone fragments results in a high incidence of serious infection. In debridement of the brain, all damaged tissue in the tract should be removed under direct vision by suction. Exhaustive search for small metallic foreign bodies usually is not indicated. However, even though they are quite innocuous by comparison with retained bone fragments, the possibility of abscess associated with indriven metal must be remembered.

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WAR INJURIES OF THE SPINAL CORD AND PERIPHERAL NERVES

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I WISH I could say as much about spinal cord injuries as head injuries encountered in time of war. Unfortunately, in contrast with methods of treating cerebral wounds, relatively little of hopeful value came out of experiences with cord lesions in the last war.

I suppose that there will always be some disagreement as to the desirability and value of surgical intervention in cases of cord injury. In at least one category, however, there has always been relative unanimity of opinion, and this group may be discussed briefly. If indication for operation exists on the basis of established general surgical principles, everyone agrees that operation is essential. In this category fall those cases in which there is compound fracture of the spine, with indriven bone or metallic fragments and leakage or leakage of spinal fluid. Operation in such a case is performed primarily to prevent or eradicate infection and isolate the cerebrospinal system from direct contact with contaminated external environment. Technical principles utilized are just the same as those in connection with penetrating craniocerebral wounds. No attempt should be made to handle the wound specifically, except for what amounts to first aid treatment, until the patient reaches an installation where thorough debridement can be performed. The latter should include excision of involved skin and muscle and laminectomy with removal of bone fragments and indriven material. Freeing or section of adjacent nerve roots may prevent subsequent radicular pain.

The dura should be closed whenever possible by usual means, including fascial transplant, in order to provide an additional barrier against contamination of the subarachnoid space. It goes without saying that the greatest care and gentleness is required in handling the spinal cord; the spinal cord cannot tolerate anything like the amount of manipulation or trauma which the brain can resist. At this point, I would like to stress the necessity of noting carefully the condition of the cord at the time of operation. This may have great importance so far as prognosis and subsequent care are concerned. Certainly, when it is known that the cord was seen to be severed or completely pulpefied at the original operation, prompt rehabilitation measures can be instituted and the patient may be spared the necessity of a second exploratory operation at a later date.

Just as in head wounds, early complete surgery is desirable but, if facilities are not adequate, this may have to be delayed. Although the cord wound may be considered as carrying top priority, one

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must not forget that penetrating wounds of the thoracic and lumbar region may be complicated by associated intrathoracic and intra-abdominal injuries. The latter may demand treatment first. In such cases, cooperation between thoracic and general surgeons and the neurosurgeon is of paramount importance since decisions as to priority of surgery may require extreme nicety of judgement.

In the emergency, or early care, of a patient with cord injury, whether open or closed, the cardinal principle is to prevent increase of the bony deformity. Bearing in mind the normal curvatures of the spine, correct positioning for transportation become a simple matter. In cervical spine injuries, the head should not be raised. The patient should be kept on his back, with the shoulders raised slightly, allowing the head to fall back and maintaining the neck in slight hyperextension. Lateral movement of the head should be prevented by laying sandbags or other articles on either side of the head. Lumbar spine injuries should be transported in a face down position on a litter. The weight of the abdomen against the sagging canvas of a litter will automatically keep the lumbar spine in a position of extension. Because of respiratory difficulty, morphine should not be given in cervical spine injuries, but may be given safely in lumbar injuries.

Most closed cervical spine injuries result in fracture dislocation, with the commonest site in the lower part of neck. It is at this point where the mobile cervical spine joins the relatively immobile thoracic spine. Similarly, and for the same mechanical reason, compression fracture at the thoracolumbar junction is most common.

Accurate determination of the level of injury can be made after only a brief survey to determine the level of sensory and motor loss. Detailed dermatomal map cannot be remembered but there are a few practical landmarks that should be kept in mind. The second rib separates the fourth cervical from the second thoracic dermatome; all intervening dermatomes lie in the upper extremities. In the male, the nipple line corresponds to T4 dermatome. The umbilicus is at the border of T10 and T11, and the inguinal region is at T12-L1. On the motor side, the biceps is innervated chiefly by C6, the triceps by C7, the psoas by L1 and L2, the quadriceps by L4, L5.

Previously, I have said that there is little question about the need for surgery in open or compound spine injuries. There has been some difference of opinion about closed injuries. The arguments against intervention have been based primarily upon the question of reversibility of cord damage due to pressure. It seems to me that, in cases in which there is evidence of progressive increase in motor or sensory loss, immediate decompression should be performed without delay. In patients with apparently "complete paralysis" immediately after injury, it has been maintained by some that decompression is worthless. Now one must remember that the phrase "complete paralysis" is based on clinical examination alone and *does not necessarily* mean complete and permanent anatomic or physiologic loss. Although admittedly the odds against obtaining improvement are great, the experience of many suggests that if there is any erring to be done, it had best be done on the side of decompression rather than to withold this hope, however small it may be. On this basis, therefore, it is recommended that, in cases of thoracic and lumbar spine injury, with "complete paralysis," if roentgenograms or manometric tests demonstrate a block, surgical decompression should be done within twenty-four hours. In middle or lower lumbar spine injuries, with involvement of the cauda equina, decompression may be effective even after twenty-four hours. Operation is preferable to attempting reduction by manipulation or extension in thoracolumbar fractures with evidence of cord involvement. In cervical injuries, however, experience has resulted in recommending traction, preferably by insertion of Crutchfield tongs. The application of tongs is simple and can be done without moving the patient from his bed.

But surgical care of the paralyzed patient is only a small fraction of the total problem. Of paramount importance is proper bed care and prevention of decubitus ulcers. Under no circumstances should a plaster cast be applied over anesthetized skin. Wherever possible, the patient should be placed upon a Stryker frame or an air mattress. Frequent turning is essential not only to prevent bed sores but also hypostatic pneumonia. It is obvious that good and devoted nursing is essential and, so far as I am concerned, were my choice to be limited to selection of one single aid in handling a paraplegic. I would swap a neurosurgeon and a urologist for one good nurse.

Care of the bladder is a major problem for two reasons: First, the prevention of urinary tract infection; and, secondly, maintenance of normal bladder capacity and muscle tone. The second objective will assume great importance later with automatic bladder function playing an important role in the rehabilitation of the patient. Ideally, the most suitable method of dealing with the bladder is through tidal drainage. Obviously this is not practical in forward areas in time of war, and one may have to be satisfied with intermittent drainage of an ordinary indwelling catheter. With reasonable care, this could tide a man over for a few days. Under some conditions of war however, because of delays in evacuation, catheter care was sometimes less than adequate. Under such circumstances, suprapubic cystotomy was performed. This is ordinarily undesirable since it diminishes normal bladder capacity, and the bladder may become scarred and contracted.

The treatment of decubitus ulcers if they develop, the problems of pain, of mass spasms, of urinary calculi, of bracing and of rehabilitation are major items in the later care of spinal cord

injuries. There is not the time to go into these but the realization of the tremendous overall problem of just one paraplegic should be kept in mind.

PERIPHERAL NERVE INJURIES

As in the case of head wounds at the beginning of the last war, it was found that the treatment of peripheral nerve injuries was antiquated. Because of infection and prolonged healing of wounds in the First World War, it was laid down that no nerve suture should be attempted within six months after wounding. Through various circumstances, this interdiction was successfully overcome.

It is reasonable to assume that if accurate approximation of nerve ends is performed early, regeneration of the nerve and restoration of muscle function would occur more readily. Only under rare circumstances can or should nerve repair be carried out immediately after injury, and these circumstances are limited only to an occasional clean, incised wound under suitable conditions in civilian life. These conditions are so rarely met in the theater of War that for practical purposes, one may say that they never occur.

In gunshot or shell fragment wounds, the desirable policy to follow is to rebride the wound and leave nerve mobilization and repair for a later date. There are two excellent reasons for this. First, if a war wound is debrided and closed primarily, infection may be expected and infection would ruin any chances of regeneration across the suture line. Secondly, and perhaps more important, it is extremely difficult to determine the limits of irreparably damaged nerve in a fresh battle wound. Contusion and hemorrhage may be extensive. Unless the surgeon excises involved nerve ends back to certainly healthy tissue, nerve regeneration will not occur.

Prolonged delay in performing nerve repair is inexcusable. The optimum time interval is probably between three and six weeks. This statement is based upon our own experiences and that of the British. Professor Seddon, who was in charge of the Nerve Centre at Oxford stated his case as follows: "The delayed operation converts the suture from a procedure carried out under restriction into one in which the surgeon is free to do as he wishes. At Oxford, all the primary sutures compare unfavorably with early secondary suture, and if I had the misfortune to suffer a nerve injury myself, I would prefer the secondary operation."

The concept of soft part wound management as developed in the Mediterranean Theater sheds a new aspect on the problem of nerve injuries as well as on the treatment of compound fractures of long bones. Precise surgery with early secondary closure, fortified by judicious use of blood and the adjunctive use of chemotherapy, resulted in prompt healing and amazingly low morbidity.

In a series of cases at our hospital, during operation for secondary wound closure, severed nerve ends were examined at intervals up to twenty days after injury. It was observed that inflammation of the damaged ends lasted until this time, thus preventing or making difficult accurate demarcation between healthy and damaged nerve. Hence, the policy became established of early secondary closure followed by nerve exploration and repair promptly after wound healing from about three to six weeks after injury. The end results, as determined by recovery of function, have attested to the efficacy of this plan. It is of interest to note that, after this time interval, not only can the neurosurgeon feel free to mobilize the nerve extensively to overcome large defects, but the epineurium is found to be somewhat thickened and placing of sutures is facilitated.

As a further step in the dramatically developed concept of wound management in the war, it was found that secondary debridement with internal fixation of compound fractures (where indicated) could be carried out within the first five to fourteen days after injury. Among the cases of compound fracture of the extremities, there was a large group with associated nerve injury. For example, at the 21st General Hospital, of 143 cases of compound fracture of the humerus which were seen in Italy alone, approximately 30 per cent also had radial nerve paralysis. At the onset, the fracture may appear to be the major problem, but the patient whose humerus or femur is well healed is disabled by concomitant radial or sciatic nerve palsy. Fortified by experiences with soft part wounds, a plan of conjoint surgery resulted. Parker and I reported two cases of combined bone and nerve repair, performed in 1944. The first was a simple screw fixation of humerus and radial nerve suture three weeks after wounding. The second case was debrided twenty-four hours after wounding. Eight days later, the humerus was shortened and plated in anticipation of making up a gap in the radial nerve, and the wound was closed. Sixteen days later, formal nerve repair was performed. Five months after injury, follow-up report showed a healed fracture and evidence of recovery of the radial nerve.

On going back over what has been said about definitive care of nerve injuries, it is apparent that nerve repair had best be done as a deliberately planned procedure. Immediate repair, as well as long delayed suture, is undesirable. One can and should plan early treatment with the objective of assuring definitive surgery from three to six weeks after injury.

So far as immediate care of war injuries goes it would seem desirable that the wound be treated as a wound and not as a nerve injury. It should be noted in all cases, however, whether there is an accompanying nerve injury either clinically or demonstrated during debridement. A few simple tests of nerve function should be made in every case of a wound of the shoulder, hip or extremities. If an extremity is encasted or splinted to the proximal phalanges, the distal phalanges may be

extended (by the lumbricals) and a radial nerve injury might be missed.

The wound should be cleansed gently, using large quantities of water and soap and saline. No alcohol or iodine should be used in the wound. Do not attempt to dissect nerves or to "tag" them with sutures for subsequent identification. If, during the course of debridement, a nerve is seen, be sure to note whether or not it has been severed. Local sulfa is of no value and may be harmful. After debridement the wound should be dressed with a layer of fine mesh gauze covered by a snug, firm dressing. About five days later, the dressing is removed and secondary closure is performed. Prompt healing may be expected, and deliberate nerve repair should then be carried out. Before as well as after nerve repair every effort should be made to exercise the joints and keep the extremity from becoming "frozen." I would urge that sympathetic block be considered more frequently, particularly in cases with wounds adjacent to, or involving, large blood vessels. It is my opinion that such blocks not only help the circulation and relieve early causalgia-like pain, but also aid in prevention of a stiff, fixed hand.

A STUDY CONCERNING NUTRITION DURING EARLY INFANCY

A COMPARISON OF INFANTS FED BIOLAC WITH THOSE RECEIVING EVAPORATED MILK FORMULAE

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This study was designed to determine the nutritional results of infants in two groups fed artificial formulae. One group received Biolac* while the control group was placed on evaporated milk feedings. The problems presented in such a comparison include the following questions:

1. Do infants tolerate Biolac as well as the standard evaporated milk and Karo syrup formula?
2. Will the presence of available iron in the Biolac preparation have any effect on blood hemoglobin?
3. Are 400 United States Pharmacopaeia units of vitamin D sufficient for prophylaxis against rickets?
4. Do infants on Biolac grow and develop as well as infants on evaporated milk formulae?
5. What is the incidence of feeding difficulties, respiratory tract infections and other illnesses of infants fed each type of milk?

From the Department of Pediatrics, St. Louis University School of Medicine.

*Expenses for this study were defrayed by a grant from the Borden Company which manufactures Biolac. The approximate composition of Biolac follows:

	Undiluted	Diluted with 1½ parts water
Fat	6.6 per cent	2.8 per cent
Carbohydrate	14.4 per cent	7.4 per cent
Milk Proteins	6.6 per cent	2.8 per cent
Milk Minerals	1.4 per cent	0.6 per cent
Calcium	0.24 per cent	0.11 per cent
Phosphorus	0.18 per cent	0.08 per cent
Iron	0.002 per cent	0.0008 per cent
Water	68.0 per cent	86.4 per cent
Calories per fluid ounce	50.0 per cent	20.0 per cent

Each tin contains 2,500 U.S.P. units vitamin A; 0.26 mg. vitamin B (thiamin); 2 mg. vitamin B_2 (riboflavin); 400 U.S.P. units vitamin D; and 8 mg. iron. Evaporated milk used was manufactured by the Borden Company and conforms to standards prescribed by law for all evaporated milk.

METHOD

Healthy newborn infants were selected from the newborn nursery at Firmin Desloge Hospital (affiliated with St. Louis University School of Medicine) who weighed between 2,750 grams and 4,000 grams. These infants were chosen as they became available between September 25, 1949, and March 29, 1950. The infants were all white and born of mothers in the same low economic group. Eighty-five infants were placed on the project, forty-five on evaporated milk and forty on the Biolac preparation.

A definite routine was established and followed in the nursery which included an examination of each infant within twenty-four hours after birth and also the day before discharge. Daily checks were made of each infant's general condition. The formulae for the infants in the two groups were increased in strength gradually, reaching the accepted normal dilution on the fourth or fifth day of life when it became apparent that the mother's supply of breast milk was inadequate.

Vitamin C drops were given to infants in both groups so that orange juice would not be necessary. Eight drops of Abbott's Cecon is the equivalent of 20 mg. of ascorbic acid. This dosage was started during the nursery stay and maintained throughout the study.

The mother was instructed upon leaving the hospital to keep a record each day of her infant's progress and condition. Each day she checked the number of bowel movements and noticed whether any diarrhea, vomiting, colic, fretfulness, colds or other illnesses were present. Mimeographed sheets were furnished for this purpose and were brought by the mother at the time of each visit.

Monthly visits were made to the clinic. At each visit the mother was questioned concerning the mentioned items and the infant was subjected to a complete physical examination. X-rays of the right hand and leg were ordered on each infant at the age of 1 month and repeated at the age of 6 months. Blood hemoglobin determinations were obtained during the first month and were repeated at the age of 2, 4 and 6 months. These values were usually performed by the photoelectric method with utlization of the hemoglobin curve after the method of Van Bruggen.[1]

A combined diptheria-tetanus-pertussis type of immunization was started at the age of 3 months. This consisted of the injection of 0.5 cc. at monthly intervals until a total of 2.0 cc. had been given.

Solid foods were not started until the fourth month in order to determine whether the available iron in Biolac had any effect on the blood hemoglobin values.

FINAL SELECTION OF CASES

A total of eighty-five infants were placed on the project. Of these, forty were on Biolac and forty-five on the evaporated milk formula. The number of examinations of the infants in each group and the average number per infant can be seen in the following table.

Table 1. *Number of Examinations*

	Biolac	Evaporated Milk
Nursery examinations	80	90
Clinic visits	170	175
Total	250	265
Number of infants	40	45
Average number of examinations per infant	6.2	5.9

During the course of the study twenty-five were removed from the project for various reasons which will be discussed later. The remaining sixty infants included thirty on Biolac and thirty on evaporated milk. These sixty comprise the number upon which the results of this study are based.

The infants compared ranged in age from 3 to 6 months. All the infants removed were less than 3 months of age. Infants failing to return for monthly checkups over the age of 3 months were, nevertheless, included in the final analysis of results.

The reasons for removal from the study can be seen in table 2.

Table 2. *Removal from Study*

	Biolac	Evaporated Milk
Failed to return to clinic	8	9
Underweight	1	2
Overweight	1	2
Prolonged hospitalization	0	2
Total removed	10	15

The cases listed under "Underweight" and "Overweight" were outside the limits originally prescribed. These, through error, were placed on the project.

One infant on evaporated milk entered the hospital because of failure to gain weight (weight 7 pounds, 15 ounces at 11 weeks of age). She improved rapidly under the hospital regime. The final diagnosis was "Feeding problem—severe; malnutrition and secondary anemia." The mother was incompetent.

The other infant on evaporated milk requiring "prolonged hospitalization" developed eschericia coli meningitis with a later secondary hydrocephalus.

RESULTS

1. *Weight Changes While in the Nursery.*—The results are listed in table 3.

Table 3. *Weight Changes*

		Number Cases	Birth Weight	Weight 7th day
Biolac:	Males	15	7.7*	7.4
	Females	15	7.7	7.7
Evaporated Milk:	Males	19	7.6	7.7
	Females	11	7.2	7.1
Average:	Biolac	30	7.7	7.5
	Evaporated Milk	30	7.4	7.4

2. *Average monthly weight gain.*—Differences were minimal and did not prove to be statistically significant. Clinically, however, the infants on Biolac did better after leaving the nursery. They consumed a larger volume and tolerated the formula well. Spontaneous, favorable comments from mothers were heard more frequently in the group on Biolac. These certainly would be difficult to evaluate. Perhaps the explanation rests in the fact that in nearly every instance the infants on Biolac were maintained on a 1:1½ formula whereas the formulas of the evaporated milk babies were changed and concentrated with advancing age. The averages are listed below.

Table 4.

Month	1	2	3	4	5	6
Biolac	9.2*	11.2	12.15	14.8	15.15	17.6
Number	30	28	23	27	24	19
Evaporated Milk	9.0	11.1	12.12	14.3	15.7	16.11
Number	29	27	28	20	18	14

3. *Monthly Weight Gain According to Maternal Parity.*—Early in the study some attempt was made to regroup the infants according to maternal parity and age of the mother. This proved difficult. In the final analysis a serious discrepancy was noted in that a larger number of infants born of primipara mothers were placed on evaporated milk. This is brought out by table 5.

Table 5. *Parity of Mother*

Parity of Mother	Number on Biolac	Number on Evaporated Milk
0	5	12
1	11	8
2	5	7
3	2	2
4 or more	7	1
Total	30	30

This unfortunate circumstance prompts the immediate remark that one could not expect infants whose mothers were primiparas to do as well as infants whose mothers had had more children and consequently more experience.

As a result the weights of infants whose mothers had had less than two children were compared with infants whose mothers had had two or more

* Throughout this report for simplicity the figure 7.7 is used to mean 7 pounds, 7 ounces.

children. The average weights at birth, 3 months and 6 months are given in table 6.

Table 6. *Average Weights*

		Birth	3 Months	6 Months
Less than two	Biolac	7.5	12.14	17.10
	Number	16	14	10
	Evaporated Milk	7.6	12.15	16.12
	Number	20	20	13
Two or more	Biolac	7.9	12.15	17.0
	Number	14	9	9
	Evaporated Milk	7.0	12.4	17.12
	Number	10	8	1

Contrary to what might be expected, these results indicate that in this study the young "inexperienced" mothers' infants thrived somewhat better than the others. Therefore, no further regrouping was attempted. It is felt that the young mothers often make up for their inexperience by their will to learn, tendency to follow the physician's instructions more closely and more available time.

4. *Growth in Regard to Head Circumference and Body Length.*—No appreciable difference was noted in the two groups. The average results are tabulated in inches at monthly intervals.

Table 7. *Head Circumference*

	Birth	1 mo.	2 mos.	3 mos.	4 mos.	5 mos.	6 mos.
Biolac	13.66	14.75	14.89	15.90	16.26	16.65	17.08
Evaporated Milk	13.62	14.97	15.30	15.89	16.24	16.56	16.79
Body Length							
Biolac	19.42	21.52	22.70	24.07	25.02	25.67	26.74
Evaporated Milk	19.43	21.42	22.98	24.11	24.94	26.14	26.54

5. *Blood Hemoglobin Determinations.*—Determinations were usually obtained at 1 month, 2 months, 4 months and 6 months of age. The average results in the two groups are found in table 8.

These results appear to be somewhat higher in the Biolac group. Particularly is this evident at the age of 2 months where the curve of Biolac infants did not drop quite as low as that of the evaporated milk infants. It is difficult to say with such a small number of cases whether or not this is due to the available iron present in the Biolac formula.

Table 8. *Hemoglobin Determinations*

	1 mo.	2 mos.	3 mos.	4 mos.	5 mos.	6 mos.
Biolac	12.77	11.57	—	11.93	—	12.61
Number	29	23		21		19
Evaporated Milk	13.00	11.03	—	12.15	—	12.42
Number	26	25		20		10

6. *General Growth and Development.*—This problem was difficult to evaluate strictly. The infants in the two groups were studied as to muscle tone, physical growth, mental development and resistance to infection. Consequently the results are based on clinical impression. Generally infants in both groups did well.

7. *X-ray Studies.*—In order to determine the incidence of vitamin deficiencies, x-rays of the right hand and right leg were taken at the age of 1 and 6 months. Only 50 per cent of the infants had follow-up films (sixteen on Biolac and fourteen on evaporated milk). In no instance was any evidence of a vitamin deficiency noted either on x-ray or from the clinical standpoint. It would appear that the amount of vitamin D in both Biolac and evaporated milk is a sufficient prophylactic amount. Observation over a period of approximately two years would be advisable before a definite decision is made regarding this point.

8. *Feeding Problems and the Incidence of Disease.*—The figures in table 9 are somewhat misleading since they may represent more than one major diagnosis for each infant. In order to show the variety of conditions appearing at this time of life, several diagnoses were often made. For example, infants with upper respiratory infections often had an associated mild secondary diarrhea, both of which are listed.

Table 9. *Diseases*

	Biolac	Evaporated Milk
Feeding problem, mild	4	12
Diarrhea, mild	10	6
Diarrhea, moderate	1	0
Upper respiratory infection, mild	13	11
Upper respiratory infection, with complications	9	18
Constipation	4	9
Rectal fissures	1	5
Asthmatic bronchitis	7	0
Seborrheic dermatitis of scalp	5	4
Granuloma of umbilicus	1	4
Hemangioma of skin	2	1
Ammoniacal dermatitis	3	0
Umbilical hernia	0	2
Conjunctivitis	1	1
Chicken pox	1	2
Thrush of mouth	1	1
Acute bronchiolitis	0	1
Virus pneumonia	1	1
Acute follicular tonsillitis	0	1
Herpetic stomatitis	0	1
Hydrocele	0	1
Gross rectal bleeding, cause unknown	0	1
Systolic heart murmur	1	0
Whooping cough	1	0
Total	66	82

Feeding problems were all mild in nature and included vomiting and colic due to swallowing of too much air. The incidence and causes were such as one would expect in any series of cases, regardless of the type of formula used. The greatest incidence occurred in the primipara mothers who had had little experience with babies.

Diarrhea in all cases, except one, was mild in nature and usually secondary to an upper respiratory infection. The one exception was an infant on Biolac with primary diarrhea who responded rapidly to sulfadiazine.

More complications, especially bronchitis, occurred following upper respiratory infections in the evaporated milk group. The reason for this is not evident.

Constipation was noted more frequently in the evaporated milk group. This could be explained by

the fact that the Biolac stool normally resembles the stool of the breast fed infant. It is, therefore, softer in consistency and less constipating. In nearly every case of constipation some cause could be found. Congenital anal stenosis requiring dilatations was present in one infant in each group. Rectal fissures were found in five evaporated milk infants and in one Biolac baby. In one Biolac infant constipation did not abate.

Asthmatic bronchitis occurred much more frequently in the Biolac group. The figure should be considered in the light of the fact that three infants had a total of seven bouts of asthmatic bronchitis.

DISCUSSION

The Biolac formula when properly diluted with cool water in a ratio of 1:1½ meets the accepted essential requirements of an artificial formula. Adequate amounts of protein, carbohydrate, fat, minerals and vitamins (except Vitamin C) are present. From the study, one finds several advantages in the use of Biolac preparation. Infants appear to like the formula and grow and develop well. In no case was an infant found to have an overabundance of fatty tissue. The ease of preparation (simply diluting a measured amount of cool, sterile water with the contents of one can of Biolac) is a decided advantage for the mother and tends to minimize the possibility of contaminating the formula. Furthermore, it is seldom necessary to change the concentration of the formula which often confuses the mother and may result, through error, in subsequent feeding difficulties.

Most physicians agree that an iron deficiency anemia may develop between the ages of 4 and 10 months. (The anemia seen between the second and third months of life is termed physiologic and does not appear to respond to iron therapy.) Dunham[2] in discussing premature infants points out that an iron deficiency anemia may be superimposed upon a more pronounced form of physiologic anemia. This has led her to recommend that prophylactic iron in infants of especially low birth weight might well be started at the age of 6 weeks.

Since iron deficiency anemias may develop early in life precipitated by such factors as rapid growth, improper diet and infection, the addition of iron to the diet early would seem advisable. Such action would present available iron if needed for the correction or the prevention of an iron deficiency anemia. The giving of a milk preparation containing iron (Biolac) would appear to be an excellent prophylaxis against just such an anemia.

In 1941 Eley[3] studied Biolac fed infants with and without iron. He concluded that "the iron content of Biolac is adequate and available for the building of new red cells and for the improvement in erythrocyte and hemoglobin levels." He also found Biolac to be "a satisfactory and suitable food substance for infant feeding."

The results in this study are suggestive of higher hemoglobin values in the Biolac group. Whether this is due to the available iron in the preparation cannot be said but certainly this mineral is available for correction or prevention of iron deficiency anemia.

A recent article[4] showed that rickets is found in newborn infants. Accordingly, the x-ray study reported in this paper was made. None of the infants exhibited signs of rickets at birth or at the age of 6 months. No evidence of scurvy could be found.

Nutritionally, infants in both groups did well. This further points out the fact that it is not the type of formula which is of major concern but rather that infants closely supervised by a physician during early infancy generally grow and develop better because minor difficulties and illnesses can be corrected before major problems ensue.

Feeding difficulties in both groups were of a minimal nature. Constipation and upper respiratory infections with complications occurred more frequently in the evaporated milk group whereas asthmatic bronchitis was seen more often among the Biolac infants. Two of the infants with asthmatic bronchitis are now on hypoallergenic forms of milk. Since these cases fit into the field of protein allergy, one cannot blame a specific milk preparation.

CONCLUSIONS

A comparison of infants fed Biolac with infants fed evaporated milk formula indicates that Biolac is as well tolerated as evaporated milk, is easier to prepare and is less likely to become contaminated.

The available iron in Biolac may have some effect on blood hemoglobin determinations and makes available iron for the correction or the prevention of an iron deficiency anemia.

The amount of vitamin D in Biolac and evaporated milk cannot definitely be said to be sufficient for prophylaxis against rickets. However, in this study none of the early clinical symptoms or signs of rickets were noted nor were any radiographic changes observed.

The growth and development of Biolac fed infants was considered more than satisfactory.

No correlation was found between the occurrence of feeding difficulties and illnesses with the type of milk formula used.

35 N. Central Ave.

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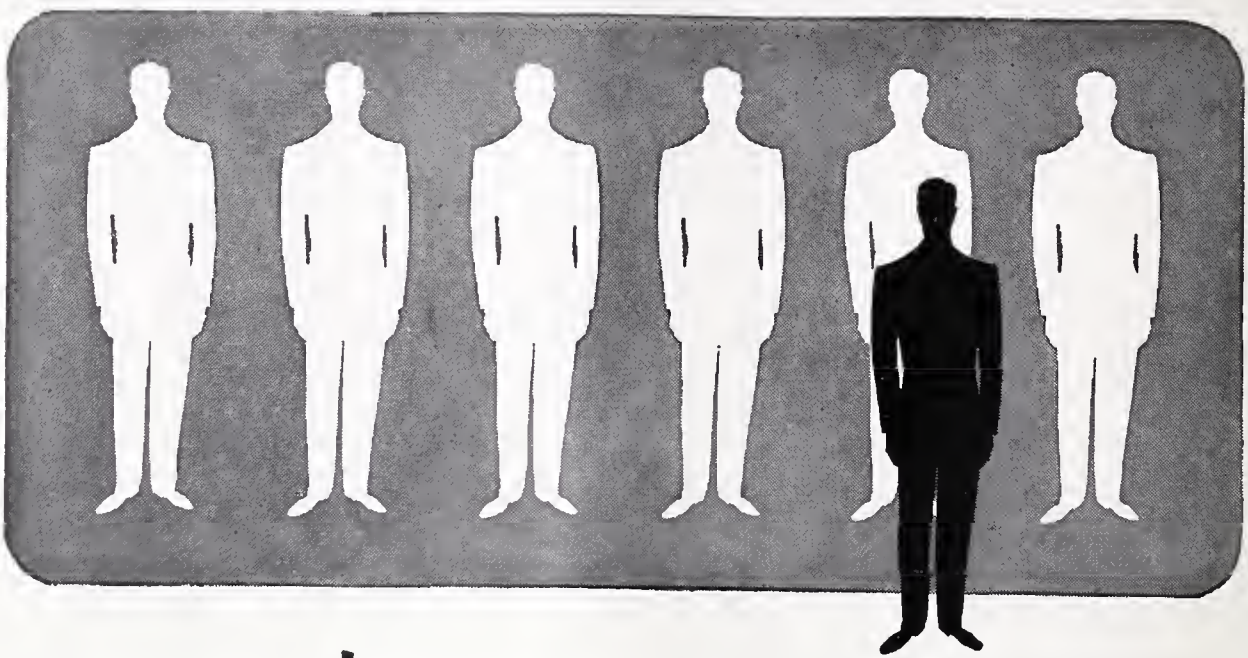
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Postgraduate Review

Rh AND Hr SENSITIZATION IN OBSTETRIC PRACTICE

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BEFORE BRIEFLY presenting an evaluation of a subject which has been a source of worry to many and a cause of grief to some obstetric patients, it is in order to review a few essential data.

First, the Rh complex includes three major subfactors, named in Wiener's[1] present terminology Rh_o (in this symbol the capital *R* indicates that it is by far the most antigenic of the factors and the o means that it corresponds to the original rhesus factor of Landsteiner and Weiner[2]), rh′ and rh," and designated by Fisher[3] as D, C, and E. Each has its reciprocal counterpart as shown in table I, the name Hr having been introduced by

Table I—*Terminologies re: Factors, Agglutinogens, Antigens*

WIENER		FISHER
	"Rh"	
Rh_o	=	D
rh′	=	C
rh″	=	E
	"Hr"	
Hr_o	=	d
hr′	=	c
hr″	=	e

Levine[4] in 1942. Just as one may possess either the A or B factor or both of them, so do the Rh and the Hr antigens exist singly or in combination in the erythrocytes of any given person. The absence of any one or more of these antigens (agglutinogens or factors) from the red blood cells of an individual fulfills a basic requirement for iso-immunization or sensitization.

Depending upon inheritance there may be almost any combination of the antigens but the three most frequent ones in the Caucasian race are as follow:[5]

Rh_o (D) and rh′ (C)..... 55 per cent
Rh_o (D) and rh″ (E)..... 15 per cent
Rh_o (D), rh′ (C), and rh″ (E)..... 15 per cent

The rare combinations are:

Rh_o (D) alone..... 2.5 per cent
rh′ (C) alone..... 1.0 per cent
rh″ (E) alone..... 0.5 per cent
rh′ (C) and rh″ (E)..... 0.01 per cent

Persons lacking all three agglutinogens are "true" Rh negatives and comprise about 13 per cent of the Caucasian population.

Fortunately the anti-Rh_o (85 per cent) serum is the most frequently encountered. As pointed out by Levine,[4] it serves as a diagnostic agent in 92 per cent of all cases of erythroblastosis fetalis, showing the father and affected infant to be Rh positive and the mother Rh negative. Likewise it serves in ascertaining the Rh status in hemolytic transfusion reactions. Rarely found alone, rh′ and rh″ antibodies occasionally appear with anti-Rh_o in the blood of a sensitized Rh-negative person. Some laboratories use an 87 per cent serum which will cause agglutination of red blood cells containing Rh_o (D) or rh′ (C) or both; however, since specific antisera are available for the three standard Rh antigens (Rh_o 85 per cent specificity, rh′ 70 per cent and rh″ 30 per cent) one should not be content to employ only one of the three. It is now customary to first check for the presence of Rh_o (D) and if it is positive then one should test for rh′ (C) and rh″ (E) reporting the result in each instance. The use of a single ("shotgun") so-called test serum is to be condemned. Likewise errors are to be expected if several reliable test sera are not employed by persons who have been properly trained.

Even though Rh-positive, a woman whose cells contain no hr′ (c) can be sensitized to this factor by a fetus having such. This type of sensitization (Hr) is quite rare because the antigen involved is relatively weak. An example will be cited subsequently.

ANTIBODIES

Although antibodies may be evoked by each of the separate Rh or Hr antigens, anti-Rh_o (anti-D) is the most important from a clinical viewpoint and this antibody can be made only by Rh-negative (D-negative) individuals. Usually when an Rh-negative person originally forms anti-Rh the serum will agglutinate Rh-positive erythrocytes in saline solutions and other watery media, consequently, the antibody is conveniently referred to as "saline agglutinin." Race[6] used the term "complete antibody" and Diamond and Denton[7] called it "early antibody." (These simple immune antibodies tend to disappear from the circulation in from three months to two years.) Later a different kind of antibody is formed due to prolonged iso-immunization, and the patient's serum will no longer agglutinate Rh-positive red blood cells suspended in saline solution because the antibody coats the erythrocytes and thereby prevents agglutination of the saline agglutinin type. For this reason Race employed the term "incomplete antibody," Wiener[8] used "blocking antibody," and Diamond[9] referred to it as "hyperimmune antibody." Although it will not agglutinate Rh-positive red blood cells suspended in saline solution it

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will agglutinate them in serum or albumin. Coombs[10, 11] devised a test for detection of blocking antibodies. He used a serum from an animal sensitized to human globulin which causes agglutination of red blood cells coated with anti-Rh antibodies. In the indirect test blood group O Rh-positive cells are incubated with the patient's serum to allow them to be coated with the antibodies. These cells are subsequently tested, after proper washings, with the antihuman serum as in the direct test. The Coombs test has proved to be satisfactory for the diagnosis of hemolytic disease of the newborn. While on the subject of tests, it should be emphasized that blood samples should be sterile and reasonably fresh (preferably under twenty-four hours and certainly not over thirty-six hours in age.) Furthermore, any blood testing sera which is used for blood grouping, Rh typing, the Coombs test, M and N, or any blood classification study should be used in accordance with the directions of the laboratory which processed them.

SENSITIZATION BY PREGNANCY

Excluding women immunized by transfusion the formation of anti-Rh in a first pregnancy is rare. Even when an Rh-negative woman has two Rh-positive babies in succession she has only about a one in ten chance of forming detectable amounts of anti-Rh. Many women only become immunized to Rh after having at least three Rh-positive babies. An Rh-negative individual with a husband of genotype Dd who has three infants has only a one in eight chance that all three will be Rh-positive.[12] Although hyperimmunization to the A and B blood group factors is frequently induced by pregnancy, there appears to be no ill effect on the infant in the majority of cases. Anti-A and anti-B occurring in the sera of Rh-positive or Rh-negative mothers occasionally produce hemolytic syndromes in group A and B infants. Spontaneous recovery is the rule although fatal cases have been reported.

The following cases, all Caucasian, are examples of iso-immunization of the gestation type.

CASE REPORTS

1. Mrs. P. H. Rh_o-; husband Rh_o+ (Genotype Rh-Rh). A healthy Rh+ male was delivered near term in 1943. During the latter part of the second pregnancy (1947) the mother's serum showed antibodies with an increasing titer. A mildly icteric Rh+ male was delivered at term. He was free of edema, pallor and hepatosplenomegaly. Antibodies were not demonstrable in the cord blood. Because of slight anemia two small transfusions were given. The baby's subsequent course has been quite normal. Due to the fact that the husband is homozygous and all progeny will be Rh+, this couple has practiced contraception since arrival of the second baby.

2. Mrs. C. J. T., Jr. B $Rh_o'-$ Hr' +; husband O $Rh_o'+$ Hr'+. In 1942 she delivered a normal female who has been proved to be B Rh_o+ Hr'+. Two years later her second pregnancy terminated with the delivery of a male whose "neck was broken."

On January 30, 1947, another stillborn male arrived at term. The patient's description of the baby is compatible with erythroblastosis of the hydrops type.

When we first saw her she was pregnant for the fourth time. Saline agglutinins were negative but Rh blocking antibodies were positive (3 plus) and continued to be so throughout her gestation. On December 13, 1950, a normal B $Rh_o'-$ Hr'+ girl was born.

(Incidentally on July 20, 1950, this patient was started on 10 mg. Pranone orally per diem and 5 mg. Hykinone intramuscularly each week.)

This husband is heterozygous; therefore, it will be interesting to see if his next child is fortunate enough to be Rh- and thereby escape the hazards that occur in cases of sensitization. This patient became so iso-immunized that she lost her third baby.

3. Mrs. H. F. Rh-; husband Rh+. As previously reported[13] this patient experienced three spontaneous abortions at three months and a fourth at five months. Her fifth pregnancy resulted in the term birth of a normal Rh+ male. The sixth was ectopic, a salpingectomy being performed. The seventh produced premature twins, both of whom survived. The mother's serum has remained free of Rh saline agglutinins and blocking antibodies which proves that this patient has escaped sensitization although there has been ample opportunity for it to occur. In this connection we concur with others[14] in the opinion that abortions occurring during the first twelve weeks of gestation do not in themselves affect the Rh situation. If a patient has had one or more abortions it is imperative that we find out whether or not she had a transfusion or cervical dilatation and uterine curettage or both.

SENSITIZATION BY BLOOD TRANSFUSION

One or more transfusions of Rh-positive blood seems to be five times as effective as two pregnancies with Rh-positive fetuses in stimulating the formation of anti-Rh. Consequently, this emphasizes the fact that Rh-negative females should not be given Rh-positive blood.[13, 15-18] Even the intramuscular injection of Rh-positive blood can stimulate the formation of anti-Rh and it is indeed fortunate that physicians have discontinued the indiscriminate practice of administering blood to infants intramuscularly. It is generally appreciated that transfusion of Rh-positive blood to Rh-sensitized women may result in serious hemolytic reactions even to the point of death. The importance of sensitizing Rh-negative females by blood transfusion cannot therefore be overemphasized. Furthermore, it is estimated that as many as one third of all cases of hemolytic disease of the newborn are due to previous sensitization of women by blood transfusion.

One of the first questions one should ask a patient is "have you ever been given a transfusion or intramuscular injection of blood?" If the answer is in the affirmative, it is important to find out when, where and by whom the blood was given. If the patient proves to be Rh-negative and the hospital record does not reveal the Rh reaction of her donor or donors it may be possible to contact them for the purpose of Rh testing. In cases of Rh sensitization maternal antibody titers should be ascertained but a rising titer does not necessarily mean that the woman carries an Rh-positive baby. An example will be cited in which the patient had a rising titer during pregnancy but delivered a normal Rh-negative infant at term. However, just because the titer remains relatively

stationary throughout pregnancy does not mean that the baby will be unaffected. Consequently, at the present time, one cannot accurately predict the degree of fetal involvement from the study of maternal titers in any individual patient. In cases of Rh sensitization the question arises as to the advisability of termination of gestation prior to the expected date of delivery in an attempt to diminish the total period of exposure of the fetus in utero. Although it is possible that the Rh antibodies may pass the placenta more freely during the latter part of pregnancy, such has not been proved. Furthermore, infants are not infrequently killed in utero by the twenty-sixth week of pregnancy by this disease. Consequently, it is evident that sufficient amounts of anti-Rh must pass the placenta at an early age. There are other factors which must be evaluated. In the first place, one must always be mindful that the fetus in utero may be Rh negative and unaffected. This is sometimes the case even though the father is apparently homozygous. Also one should not superimpose prematurity upon hemolytic disease. However, in cases of multiparity, especially those having had previous difficulties, one may elect to induce labor during the thirty-seventh or thirty-eighth week. We do not advocate the performance of cesarean section in cases of iso-immunization unless there is a definite indication for section such as contracted pelvis with cephalopelvic disproportion, placenta previa or the like. If the cesarean is of an elective type as is usually the case in a repeat section one may well perform it during the thirty-seventh or thirty-eighth week. Because of the variation in severity of hemolytic disease in successive pregnancies, "therapeutic" abortion is not advisable. It is much better that individuals who have had erythroblastotic babies prevent conception. Such patients may desire sterilization with their request granted but the following possibilities should be considered and the patient so informed: (1) she may produce a viable Rh-positive baby despite a bad history; (2) her husband, though apparently homozygous, may be heterozygous and father an Rh-negative infant; (3) a means of inhibiting Rh antibody may be discovered; or (4) she may later marry an Rh-negative man. Some couples might be interested in the subject of artificial insemination employing an Rh-negative donor.

The following cases are examples of sensitization resulting from the administration of Rh+ bleod to Rh- persons.

CASE REPORTS

1. Mrs. U. H. A Rh–; husband A Rh+. When this patient was 12 years of age she received 500 ml. blood from her uncle (he has been proved to be Rh+) without known reaction. Her first infant was markedly jaundiced and expired two days after birth. Autopsy proved erythroblastosis. During her second pregnancy blocking antibodies were demonstrated and the baby died in utero. "Rh hapten" was administered to her during the third gestation without effect on the Rh antibodies; furthermore, she had a severe allergic reaction to the preparation. Intrapartum fetal death occurred and the baby proved to be Rh+ with a 4 plus positive Coombs test. One of our confreres has hysterectomized this patient. When she received her transfusion (1935) the Rh factor had not been discovered nevertheless, we see what havoc it raised in her case. A single transfusion of Rh+ blood provided the setup for erythroblastosis fetalis and hemolytic transfusion reactions.

2. Mrs. P. E. M., Jr. O $Rh_o'-$ Hr'+; husband B $Rh_o'+$ Hr'–. At 18 years of age (1934) she received five blood transfusions. (The hospital reports that her record has been misplaced, and she knows nothing about the donors.) In 1948 she had a spontaneous complete abortion at the sixth week of gestation. On February 27, 1950, the size of her uterus was compatible with cyesis of two months and her serum was negative for Rh agglutinins and blocking antibodies. On August 14, 1950, we were somewhat surprised to find the Rh blocking antibodies to be 3 plus positive. The Rh saline agglutinins continued to be negative. On August 17, the Pranone-Hykinone regimen, as already mentioned, was begun (and again quite skeptically at that). On September 23, 1950, a seven pound ten ounce B Rh+ Hr'+ female arrived. Her skin was clear but the umbilical cord was jaundiced. Her Coombs test was positive (1 plus). Although she had no anemia or hepatosplenomegaly the pediatrician gave 100 ml. blood. Subsequent progress has been entirely satisfactory. This patient is fortunate in that the blood transfusions did not produce Rh blocking antibodies. Since her husband is heterozygous it is hoped that her next baby will be Rh–.

2. Mrs. DeB. Rh–; husband Rh+. As previously reported,[13] in 1940 she was given five blood transfusions after operation for ruptured appendix. (In 1945 one donor was found to be Rh+.) First pregnancy terminated with the delivery of a macerated stillborn baby in 1944 (elsewhere erroneously reported to be Rh+ January, 1945). In April of that year she was proved to be Rh– and iso-immunized. Cesarean was performed one month prior to the estimated date of delivery but the five pound baby developed icterus and expired in three days. During her third pregnancy the blocking antibody titer was high. She was given numerous injections of "Rh hapten" without effect on the antibodies. Fortunately, the delivery brought forth a normal Rh– female, thereby proving the heterozygosity of the husband in this case.

4. Mrs. B. F. S. A $Rh_o'-$ Hr+; husband O $Rh_o'+$ Hr'+. In June 1946 she had a left salpingectomy for ruptured eccyesis. Although she (a daughter of a physician) and her physician-husband knew that she was Rh- she was given 500 ml. Rh+ blood due to the emergency and for the reason that the hospital at a camp for men had only blood of that type. Subsequently, she received three Rh- transfusions. August 27, 1947, in another state, she produced a normal A Rh+ Hr'+ male although blocking antibodies were demonstrable during the pregnancy. On May 25, 1949, we delivered her of a kernicteric Rh+ female. Transfusions were given to the baby and she is beginning to walk at the twenty-second month. She is not spastic.

On January 22, 1951, an erythroblastotic (nonhydropic) female was delivered. The baby expired while a transfusion was in progress. During the last pregnancy blocking antibodies were positive by the albumin (4 plus) and trypsin methods.

This case emphasizes the danger of giving Rh+ blood to an Rh- individual even in the event of an emergency. The patient is grateful that her life was saved but she states, "if only a needle had been stuck into my cul-de-sac I would have been operated upon promptly and would not have needed any

blood." In fairness to her husband it should be said that his diagnosis was correct but his superiors thought it better to observe the case rather than operate too hastily.

5. Mrs. S. B. R. B Rh_o'– Hr'+; husband O Rh_o+ Hr'+. On October 24, 1940 this patient developed toxemia and was cesareanized, a living five pound three ounce O Rh_o'– Hr'+ male being obtained. She states that she developed a postoperative parotitis and was given three transfusions during a hospital stay of twenty-four days. (The donors have not been available for Rh testing.) In December of the following year a repeat section was done and a normal seven pound two ounce O Rh+ Hr'+ male was delivered. Her third pregnancy resulted in an incomplete spontaneous abortion at eight weeks. Dilatation and curettage were done and a week later, according to the history, radium was applied for twenty-nine hours. She was told that the purpose of the radium was "to shrink the uterus and control bleeding." In June 1945 she had a spontaneous complete abortion at six weeks. When she came under our observation she was pregnant for the fifth time. Rh blocking antibodies (albumin method) were strongly positive. On April 26, 1947, a seven pound normal B Rh_o'– Hr'+ male arrived by section performed at the thirty-eighth week. During her last pregnancy Rh agglutinins were negative but the blocking antibodies were positive (3½ plus). (The Hykinone-Progesterone regimen was started on October 17, 1950, with skepticism.) On December 13, 1950, and February 21, 1951 the albumin method proved the blocking antibodies to be 2 plus positive and the trypsin method positive. On April 14, 1951, a fourth cesarean was performed, a 7 pound 5 ounce B Rh+ female being obtained. The amniotic fluid was quite clear and the placenta was grossly normal. The baby was free from icterus and clinically appeared normal. The Coombs test was positive (3 plus). The cord hemoglobin was 13 gm. and the erythrocyte count was 4.36 million, therefore, a 500 ml. replacement transfusion was given promptly. Twelve hours after birth the Hb was 17 gm. and the red blood cell count 6.14 million. Twenty-four hours after birth the Hb was 14 gm. and the red blood cell count 5.22 million. Slight icterus was present but the baby appeared quite normal. Subsequent progress has been quite satisfactory. It will be noted that this patient had an Rh– cesarean baby followed with three transfusions of unknown Rh type blood. Her second section produced a normal Rh+ male. The third and fourth gestations resulted in abortions at eight and six weeks, respectively, dilatation and curettage being done after the first one. Rh blocking antibodies were demonstrated during the fifth pregnancy and a normal Rh– female was delivered by section. During the last pregnancy the antibody titer rose and the trypsin test was positive. An apparently normal female obtained by section number four proved to have a positive Coombs test and a cord hemoglobin of 13 gm., consequently, the pediatrician gave a 500 ml. immediate replacement transfusion with good results.

6. Mrs. J. V. A. A Rh_o'– Hr'+; husband A Rh+ Hr+. Although this patient has had no transfusions there is some question as to whether she may have been given blood intramuscularly as a baby. Her first pregnancy terminated normally with the delivery of an A Rh_o+ Hr'+ male on February 20, 1948. There was no evidence of any Rh agglutinins or antibodies during gestation, including the last week. On January 17, 1951, the Rh agglutinins were negative but the blocking antibodies proved positive (3 plus) by the albumin method and weakly positive by the trypsin method. Beginning on February 13, 1951, 150 mg. cortisone were administered orally for three days, then 100 mg. daily for the remainder of the pregnancy as per the suggestion of Dr. John H. Dent. Blocking antibodies persisted at 1:16 and one report March 9, 1951 showed a titer of 1:64. On March 22, 1951, an 8 pound 7 ounce A Rh+ Hr'+ male was delivered in apparently good condition. Coombs test was positive (4 plus). Hb proved to be 11.5 gm. and the red cell count 3.9 million. Transfusions were given and the baby was discharged on the fourteenth day in apparently good condition.

Hr Sensitization

Only two known cases of Hr iso-immunization have been encountered in New Orleans. The following example has been previously reported:[18]

Case Report

I. L. G., quadroon, aged 26 years, received "several transfusions" while hospitalized in 1938 for surgical therapy of Paget's disease of the breast. Insofar as she knows untoward reaction did not occur. Her four pregnancies were apparently normal and she delivered living, evidently normal females in 1941, 1943, 1945 and 1946. The last one developed intense icterus and erythroblastotic anemia when 18 hours of age, but fully recovered after several transfusions of blood. The serologic studies were as follows:

		D Rh_o	C rh'	E rh''	c hr'	
Father	O	+	O	O	+	Rh_o (RhHr)
Child #1	A	+	+	O	+	Rh_o' (RhHr)
Child #2	O	+	+	O	+	Rh_o' (RhHr)
Baby	O	+	+	O	+	Rh_o' (RhHr)
Mother	A	+	+	O	O	Rh_o' (RhRh)

Serum: Hr_o agglutinins: + (weak)
Hr' hyperimmune antibody ++++

The second case was diagnosed within the last three months.

It has been appreciated for several years that if a person is Rh positive he or she may be Hr positive or Hr negative but if an individual is Rh negative he or she will be Hr positive.

Discussion

It is quite obvious that prophylaxis of Rh sensitization is so important that it cannot be overemphasized.[19, 20] Inasmuch as nothing can be done to prevent Rh-positive males from marrying Rh-negative individuals, the present important duty is to be certain that no Rh-negative female, regardless of age or marital status, is ever given any Rh-positive blood. The day has come when every obstetric patient should have her Rh and Hr status known. If she has had one or more transfusions, data concerning the Rh and Hr of the donors should be obtained if possible. When the wife is Rh negative or Hr negative, it is mandatory that the Rh and Hr type of her husband be ascertained. Likewise, if she is Rh-positive and there is a history suggestive of possible iso-immunization, the same applies. Actually from the standpoint of obtaining the genotype of the couple's offspring it is desirable that the Rh and Hr type studies be carried out in every case. The Rh and Hr typing of the children is indicated when the wife is Rh-negative or Hr-negative.

Rh and Hr antibody tests or both should be

done when the Rh and Hr tests or both give a positive reaction in the case of one of the marital partners and a negative in the case of the other. Even if both husband and wife are Rh+ the tests should be employed if the wife's history suggests possible iso-immunization. Antibody tests should be done as early in pregnancy as possible if there is a question of Rh or Hr sensitization. If negative, they should be repeated at the thirty-fourth week of pregnancy. If positive, they can be repeated at intervals of four weeks or oftener.

The subject of interpretation of tests for antibodies is quite important. If they remain negative by the thirty-fourth week the prognosis is usually excellent inasmuch as absence of iso-immunization is indicated. Antibodies appearing twelve weeks or less before term usually indicate the possibility of a mild hemolytic disease with an ultimately good prognosis. In this connection tests prior to the pregnancy or early therein would indicate whether such antibodies were residual in type. If such were the case one would naturally be interested in following the antibody titer during the gestation, realizing full well that in many cases there is no accurate correlation between antibody titer and the severity of hemolytic disease. The type of antibodies is definitely significant in that blocking antibodies, as a rule, reflect a more serious prognosis. Futhermere, the early appearance of blocking antibodies is usually quite important. At the present time there is no available means of *in vivo* neutralization of Rh or Hr antibodies in pregnant women.

Weiner, Reid, Roby and Diamond[21] pointed out that afibrinogenemia may develop in an occasional sensitized Rh-negative patient with a dead fetus in utero and that, unless this situation is recognized and properly treated, serious hemorrhage may occur intrapartum or postpartum. They advise fibrinogen replacement in such cases while the patient is asymptomatic and prior to the onset of labor. This indicates the necessity for being on the alert concerning the possibility of fetal death in utero in cases of iso-immunization.

As pointed out, premature delivery, by induction or cesarean, while theoretically beneficial in removing the baby from a harmful environment, has not in our experience seemed to confer any real advantage, and has obvious disadvantage. What then must one do if there is the possibility of sensitization in a given case? The present answer is to be ready to come to the rescue of the baby with transfusion "immediately" after birth. This means that all preparations will have been made so that the baby's cord blood can be tested for blood group, Rh reaction and blocking antibodies as revealed by the Coombs technic. During the labor over-sedation is to be avoided. Delivery under saddle block or spinal analgesia should be considered. In some cases local infiltration anesthesia may be decided upon. At any rate narcotization of the baby should be avoided. Furthermore, the umbilical cord should be clamped immediately after birth without stripping blood from the placenta into the baby. It is desirable to leave several inches of the cord attached to the baby so that blood can be drawn easily and to facilitate transfusion if such becomes necessary. Oxygen should be administered to the baby and chilling avoided. Decision regarding a 500 ml. replacement transfusion is governed by the presence of the following indications (modified after Diamond et al[22]).

INDICATIONS FOR IMMEDIATE EXCHANGE TRANSFUSION

1. Clinically apparent erythroblastotic baby (less than 24 hours of age). Jaundice, hepatosplenomegaly, pallor, edema or petechiae, or a red blood count of less than 4,500,000 with Hb less than 13.5 gm.
2. Rh positive baby as demonstrated by direct testing or a positive direct Coombs Test, and the maternal titer of Rh antibody was 1:16 or higher at some time during pregnancy.
3. Rh positive baby and there is an unfavorable past history, particularly kernicterus in a previous sibling.
4. Rh positive premature baby whose mother has demonstrable Rh antibodies (particularly blocking antibodies) during the pregnancy.

INDICATION FOR SECOND EXCHANGE TRANSFUSION (12 to 24 hours after the first)

Whenever the liklihood of kernicterus appears great. Examples are (1) premature baby of a highly sensitized mother who has had a kernicteric infant; (2) baby that becomes intensely jaundiced within 12 to 24 hours after exchange transfusion done at birth. The transfusion should be given when the jaundice is "moderate" rather than waiting until the skin of the baby looks like that of an old stale lemon because by that time damage has been done.

CONCLUSIONS

1. The Rh Hr status of every obstetric patient should be determined.
2. Information concerning transfusions which the patient may have received is important. Furthermore, it is well to remember that pregnant patients may become candidates for transfusions of the emergency type.
3. If the wife is Rh or Hr-negative the husband's blood should also be tested. Even though her blood proved to be positive, an examination of his blood is important from the standpoint of the genotype of their offspring.
4. If there is a possibility for the occurrence of sensitization, tests for Rh antibodies should be performed.
5. Although antibody tests should be done early in pregnancy, it is necessary to recheck later even though they be absent or weakly positive at the time of the first test.
6. If antibodies are found the titer should be determined at intervals during pregnancy realizing

that in many cases there is no accurate correlation between the titer and the severity of hemolytic disease of the newborn.

7. The type of antibodies, namely blocking, is of more significance than the titer in most cases.

8. The pregnancy should not be terminated prematurily with the idea of removing an Rh-positive fetus from an unfavorable enviroment. Unless the husband is proved to be homozygous there is at present no definite way of proving that the fetus in utero is Rh-positive. In all cases of sensitization preparations should be made to perform a Coombs and hemoglobin determination on the cord blood at the time of delivery.

9. During labor, delivery and neonatal life, the baby should be protected from hypoxia. Rh or Hr sensitization is not considered by us to be an indication for cesarean section. Furthermore, we do not recommend therapeutic abortions in such cases.

10. In cases in which the husband is homozygous and the iso-immunized mate has produced erythroblastotic babies, sterilization is recommended provided the wife and husband decide upon this after having been told that the Rh situation will not play a role in pregnancies fathered by an Rh-negative individual. The wife may be at an age at which she might later marry an Rh-negative man.

11. All Rh-negative females requiring transfusion regardless of their age or marital status should be given only compatible Rh-negative blood.

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RHEUMATIC FEVER KILLS MORE GIRLS THAN BOYS, STUDY REVEALS

The death rate for girls suffering from rheumatic fever and heart diseases is slightly higher than the mortality rate for boys, a recent study revealed.

The study, made by Dr. George Wolff, Washington, D. C., also disclosed the fact that death rates in the Middle Atlantic and Western Mountain regions average slightly higher than in the rest of the country. A report of his findings is carried in the March 10 *Journal of the American Medical Association.*

For his survey, Dr. Wolff selected the period from 1939 through 1948 and divided the total number of children's deaths from rheumatic fever and heart ailments during that time into three age groups—5 through 9, 10 through 14, 15 through 19. Both white and non-white children are included.

Characterizing the age, race and sex differences in mortality revealed by the study he said:

"There was a distinct rise with age in mortality from rheumatic heart diseases in each succeeding age group from 5 to 19 years, for both races and both sexes. Death rates were consistently higher for non-white children than for white, a fact that suggests a more unfavorable environment increases the risk of dying from rheumatic heart diseases. Finally, the death rates were somewhat higher among girls than boys. An exception was the much lower rate for white girls 15 through 19 years old, as compared with that for white boys, while non-white girls of this age had a markedly higher death rate than non-white boys."

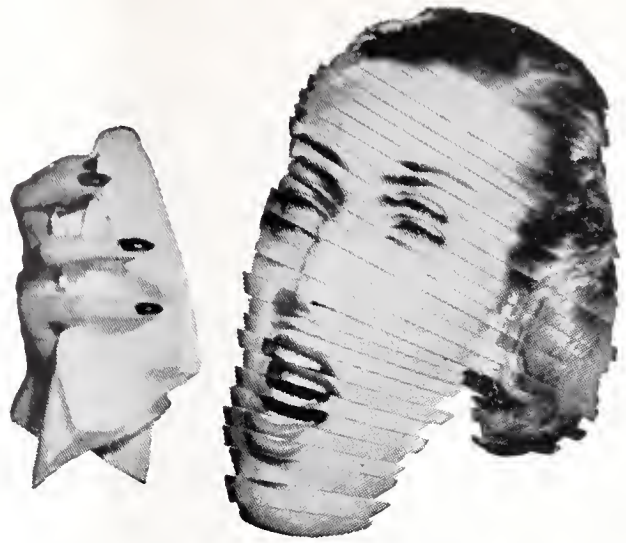
The survey also showed that mortality among the nine geographic divisions of the country varied. "For both white and non-white children," the report said, "the death rates for acute rheumatic fever plus heart diseases are below average in the South, while in the Northeast, especially in the Middle Atlantic division, they are significantly above average. In the Pacific division the death rates are as low as in the South and significantly below the country's average, while in the Mountain division they are exceptionally high for the white children in all age groups." (This bears out the frequent observation that in warmer climates rheumatic fever tends to be less prevalent and less severe.)

Although rheumatic fever and heart disease have advanced to a leading place among the killers of children, this advancement, Dr. Wolff points out, is not due to an increase in mortality from those diseases but to the decline in other childhood diseases.

Actually there is a distinct decrease in mortality among white children over the last decades. He cited the 70 per cent decrease for the age groups 5 through 9 and 10 through 14 from 1919 to 1921 to 1944 and 1945, and the 60 per cent decrease for the age group 15 through 19 years. The downward trend is continuing at the present. The average yearly death rate during a three-year period from 1939 to 1941 was 4,858 deaths. The number of deaths in 1948 was 2,515. These totals also include the under 5 years of age group.

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*Reference: MacBryde, C. M., et. al., A New Synthetic Estrogen, J.A.M.A., 123; 261: 264-(10-2) 43.

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Clinical Conference

CLINICAL PATHOLOGIC CONFERENCE

This 54 year old female entered the hospital for the first time on October 20, 1948, and was discharged on November 24, 1948.

Chief Complaint.—Weakness of three week's duration.

Present Illness.—In September 1948, the patient was stung by about thirty "yellow jacket bees." Shortly thereafter she developed swelling of the face with fever. There were no chills. She also began having weakness which persisted until the time of her admission to the hospital. She received sulfa drugs prior to admission and developed an erythematous, nonpruritic rash over the body.

Physical Examination.—Temperature was 102 F., pulse 120 and blood pressure 160/90. The patient was a fairly well developed, poorly nourished female. The skin and mucous membranes were pale. There were confluent, erythematous areas over the body. The heart was essentially normal except for a soft apical systolic murmur. Chest examination revealed diminished breath sounds with some fine crepitant rales at the left base posteriorly. Abdominal examination gave normal findings. There was slight sacral and pretibial pitting edema. Chest x-ray showed a bronchopneumonic infiltration in the lower half of the left lung field.

Laboratory Data.—Red cell count was 1,700,000, Hb. 5.8 gm., white cell count 1,700. Differential showed 2 stab, 13 segment, 84 lymphocytes and 1 monocyte. Urine showed a trace of albumin and otherwise was normal. Platelet count was 61,320 per cu. mm. Reticulocytes were 2.2 per cent. Fragility test was normal. Fasting blood sugar was 102 mg. per cent; nonprotein nitrogen 20 mg. per cent; diastase 63 U.; Kahn test negative; total proteins 6.5 gms.; albumin 3.7, and globulin 2.8. Agglutination tests for typhoid, paratyphoid, brucella and tularemia were negative. Blood cultures, aerobic and anaerobic, were negative. Gastric analysis showed no free HCl present. Bone marrow aspiration on October 26, 1948, showed a definitely hypocellular marrow. Repeat aspiration done when the patient's blood count had returned to normal showed a mildly hyperplastic marrow.

Course in Hospital.—The patient was treated with intensive penicillin therapy with no effect. Streptomycin was then given following which her temperature dropped slowly. She received nine blood transfusions as well as iron, crude liver and folic acid. By November 13, her red blood count was 4,200,000 and the white blood count 5,250. Temperature was normal. After temperature returned to normal, she developed an acute arthritis with definite swelling as well as redness and tenderness of the joints. This responded to salicylate therapy. The patient was discharged on November 24 much improved.

Second Admission.—The patient entered the hospital for the second time on August 16, 1949, for an operation on her varicose veins. On admission she was found to have a temperature of 102 F. Her blood counts revealed red blood cells 1,960,000, white blood cells 5,300, Hb. 5.3 gm., hematocrit 20 per cent.

The operation was postponed because of these findings. She received six blood transfusions. Her temperature gradually subsided and the red cell count became elevated to 4,720,000 on September 16, 1949. The patient also had a persistent leukopenia and thrombocytopenia. Gastric analysis revealed free acid. Bone marrow, on this admission, showed an extremely hypocellular marrow with increase in fat. No definite tumor cells were seen.

The patient developed a conjunctivitis with ulceration of two small areas on the cornea. This responded to local medication.

Chest x-ray was negative. The patient was discharged on September 17.

Third Admission.—The patient entered the hospital on October 31, 1949, because of weakness and pallor. Examination on admission was essentially the same as on the previous admission.

Laboratory data on entry revealed red blood cells 3,740,000; white cell count 2,000; Hb. 11.5; platelet count 58,800; no clot retraction; Bence Jones protein, negative.

The patient was given multiple blood transfusions, liver extract, pentnucleotide and yellow bone marrow. She developed a temperature elevation during hospitalization. The spleen was palpable. The temperature subsided in a few days and the spleen became smaller.

Bone marrow aspiration showed extreme hypoplasia with myeloid-erythroid ratio of 20 to 1. A specimen of sternum was removed by trephine. This showed a hypoplastic marrow and some young atypical cells which were only remotely suggestive of tumor cells. The patient was discharged improved on December 4, 1949.

Fourth Admission.—The patient was admitted to the hospital on January 7, 1950, with a chief complaint of generalized weakness. She also complained of occasional chest discomfort and dyspnea on exertion.

Physical examination revealed marked pallor of skin and mucous membranes, a soft systolic murmur over the entire precordium. The liver was palpable two fingers below the right costal margin. Blood pressure was 130/74. There were no other significant physical findings.

Blood counts on admission were red blood cells 1,940,000; Hb. 6.4 gm.; hematocrit 20; white blood cells 1,350. The patient received four blood transfusions and was discharged on January 20 at which time the red blood count was 3,180,000. Her temperature during hospitalization varied from

100.4 F. to 105 F. She had received aureomycin, 250 mg., every three hours for three days.

Fifth Admission.—The patient was admitted on May 3, 1950, with the chief complaint of weakness. Examination revealed pallor of skin. There was a grade II systolic murmur over the entire precordium. There was an opacity of the left cornea secondary to the previous conjunctivitis and iritis. Red blood cells were 3,080,000. The patient received blood transfusions and was discharged on May 8.

Sixth Admission.—The patient was admitted on May 9, twenty-four hours after previous discharge. She had temperature elevation and was extremely weak. No other symptoms could be elicited.

Examination revealed a temperature of 104.6 F., pulse 120, blood pressure 130/64. There was marked pallor of the skin. There was a grade III blowing systolic murmur over the entire precordium. Chest examination showed dulness to percussion, bronchial breath sounds and fine rales over the right upper one half of the lung field anteriorly. There were some fine crepitant rales at both bases posteriorly. Chest x-ray on May 17 showed an extensive confluent pneumonic consolidation involving the upper one half of the right lung. There was a small amount of linear infiltration in the middle third of the left lung field.

Laboratory data showed red blood cells 2,420,000, Hb. 8.5, hematocrit 28, white blood cells 950. Differential showed 44 segments, 52 lymphocytes, 4 stabs. Urine showed 2 plus albumin.

The patient received penicillin, 50,000 units every three hours; Streptomycin 0.5 gm. every six hours for two days; Aureomycin 500 mg. every six hours and multiple blood transfusions.

The patient improved slowly with return of temperature to normal on May 29. Chest examination showed normal findings and the patient was discharged on June 16. During her hospital stay she had a cough and a moderate amount of greenish yellow sputum. There was no hemoptysis. Her blood counts showed a persistent leukopenia with relative neutropenia. On discharge the red blood count was 3,840,000 and the white count 5,150.

Seventh Admission.—Admission was on August 23, 1950, for blood transfusion. Red blood count was 1,140,000 with white blood count 800. After six blood transfusions, the counts were 4,700,000 and 1,650. Differential count showed 12 segments, 86 lymphocytes and 2 monocytes. Platelet count was 11,040 on August 24. Fragility test was normal.

Chest x-ray revealed extensive infiltration in the right upper lung which had not changed appreciably during the last three and a half months and hilar adenopathy on the right. Chest fluoroscopy on August 30 confirmed these findings. Tuberculin, first strength, was positive. The patient was discharged on August 31.

DISCUSSION

G. O. Broun, M.D.: This patient was stung by bees and then received sulfa drugs. The patient entered the hospital for the first time on October 20, 1948. After receiving the sulfa drugs, she developed an erythematous nonpruritic rash over the body.

Bee venom may produce certain deleterious effects on the body; nevertheless, one must always be suspicious of the sulfa drug and so one may ask how much of the patient's difficulties is due to the bee's venom and how much to the sulfa drug, or was it a combination of both. There was a marked anemia, a relative agranulocytosis and a marked leukopenia with 1,700 white cells and only 15 per cent granulocytes with a total granulocyte count of about 250. With a severe anemia and a low platelet count, at that stage, one was dealing with anemia, leukopenia, agranulocytosis and thrombocytopenia. A reticulocyte count as high as 2.2 is a little unusual.

These effects can be produced by an aplasia of the bone marrow dependent upon sulfa drug administration. It is noticed that the first bone marrow aspiration revealed a hypocellular marrow which improved and became slightly hyperplastic when the patient's blood count returned to normal. However, during that time the patient had had intensive penicillin therapy and then streptomycin therapy following which her temperature slowly dropped. I think it is worth noting that apparently streptomycin had more effect on the temperature than did penicillin.

Transfusions, iron, crude liver and frolic acid were given and by November 13 her red count was normal and the white count was 5,250. The temperature was normal. Then she developed an acute arthritis with definite swelling, redness and tenderness of the joints. This may or may not be a reaction to penicillin. At that time the x-ray of the chest showed bronchopneumonic infiltration of the lower one half of the left lung and retrocardiac area. The patient, however, was discharged on November 24 much improved. She apparently was in fair health from November 24, 1948, until her second admission to the hospital on August 16, 1949, although the blood picture may have been abnormal during this period. The second admission was apparently for an operation for varicose veins but it was found that her temperature was 102 F. and marked anemia, thrombocytopenia and leukopenia were present. Free acid was present in the gastric juice. The bone marrow showed an increase in fat and was hypocellular. She had a conjunctivitis with small ulcerations which responded to local medication. At that time the chest x-ray was normal and she was discharged in September of 1949.

A year after her first admission she again entered the hospital with weakness and pallor. She then had 2,000 white cells and a red count of 3,700,000, platelet count of 58,800 no clot re-

traction, no Bence Jones proteins. Blood transfusions, liver extract and yellow bone marrow and pentnucleotide were administered. Her temperature was elevated during hospitalization and the spleen was enlarged. The temperature subsided in a few days and the spleen decreased in size. The bone marrow was hypoplastic with a myeloid-erythroid ratio of 20 to 1. A specimen removed from the sternum by trephine showed a hypoplastic marrow with some young atypical cells which were only remotely suggestive of tumor cells.

There was a small amount of linear infiltration in the middle one third of the left lung field. The anemia was still present with a leukopenia of 950; the differential showed 44 segments, 52 lymphocytes and 4 stabs. There was 2 plus albumin in the urine. She improved slowly on therapy, her temperature returned to normal and the chest examination also returned to normal. The patient again was discharged. The leukopenia with relative neutropenia persisted but the anemia was not quite so severe.

She returned on August 23, 1950, and her count was 1,140,000 with 86 per cent lymphocytes. The platelet count was 11,000 with a normal fragility test. There was extensive infiltration in the right upper lobe of the lung.

The eighth and final admission was on September 29, 1950, at which time the patient had consolidation of the upper two thirds of the right lung, fever and anemia.

Eighth Admission.—The patient was admitted on September 29, 1950, with the chief complaint being weakness. At that time the patient gave a history of cough productive of about one teaspoonful of "white phelgm" per day which was occasionally streaked with blood. There were no chest pains, chills, fever or night sweats. Her temperature was 102.5 F. and pulse 100. There was tubular breathing and impaired percussion note over the upper two thirds of the right lung field anteriorly. The liver was felt three finger breadths below the right costal margin.

Laboratory Data.—Red cell count was 2,400,000, Hb. 7.5, white cell count 1,600; differential showed 12 stabs, 20 segments and 68 lymphocytes.

Chest x-ray on September 30 showed no appreciable change from the previous x-ray. Attempts to obtain sputa for examination were unsuccessful.

The patient received Aureomycin and Chloromycetin. Her temperature elevation of 103 to 104 F. persisted. The patient refused blood transfusions and further aid, stating that she preferred to die. She became weaker, comatous and died on October 31, 1950.

DISCUSSION

DR. BROUN: The first x-ray showed a bronchopneumonic consolidation of the left lobe with shadows in the left lower chest, not too striking but nevertheless quite definite. That was on the left side. The left hilum was not strikingly enlarged. It was about within normal limits. Part of it was over the left rather than being pushed over to the right. The right costophrenic center could be seen and so the consolidation was not quite the usual density that fluid would show.

The x-ray taken later shows a fairly similar sort of picture as the previous one. There was still

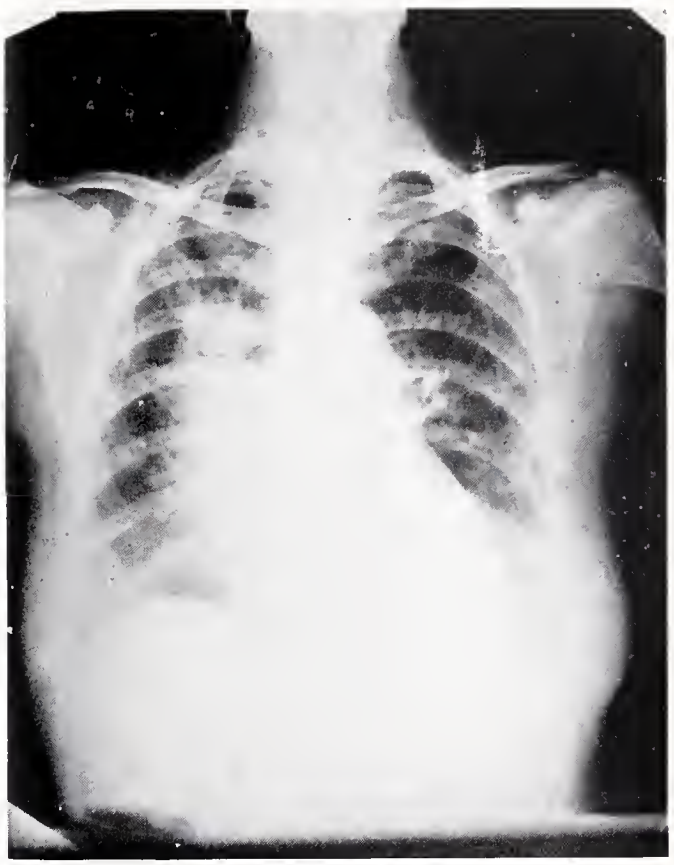


Fig. 1. Extensive involvement of the middle two thirds of the right lung can be seen.

a shadow toward the left base; the right hilus was not remarkable. This obviously was a plate taken standing when the patient was somewhat better and an extensive imvolvement of the middle two thirds of the right lung can be seen (fig. 1). Three months elapsed between pictures. The third was taken one month after the second and showed pretty much the same sort of picture with some decreased aeration in both bases, more marked in the right hilus and the midportion of the right lung.

As I told you a moment ago, we have here what looks like an aplastic anemia and one could easily ascribe that picture to bone marrow aplasia secondary to sulfa drug sensitivity. But when we get the x-ray pictures and the result of the bone marrow biopsy, in which cells were found which might have been tumor cells, we begin to speculate about the possibility of a neoplastic process in the right lung. Now, whether the lung condition existed in the beginning or was a subsequent development superimposed on an aplastic anemia caused by sulfa drug is another question. I would stress then the possibility that all of the findings

could have been due to bone marrow injury, possibly from the stings or from the sulfa drug and, secondly, that a neoplastic process might have been developed in the right lung.

There are two other thoughts that I believe are pertinent. I have seen, in one or two cases, the picture of aplastic anemia associated with miliary tuberculosis. I do not think that all miliary tuberculosis shows such a picture by any manner of means but in one or two cases of miliary tuberculosis I have seen the picture of anemia, leukopenia, thrombocytopenia and splenomegaly develop. Now this shadow in the right lung is much too confluent and dense certainly for the usual picture of miliary tuberculosis but the fact that streptomycin at one time apparently had some influence suggests the possibility that tuberculosis might not be totally out of the question. Finally, we do note that the pulmonary condition tended to come and go, so that it really is a picture of repeated attacks of pneumonitis.

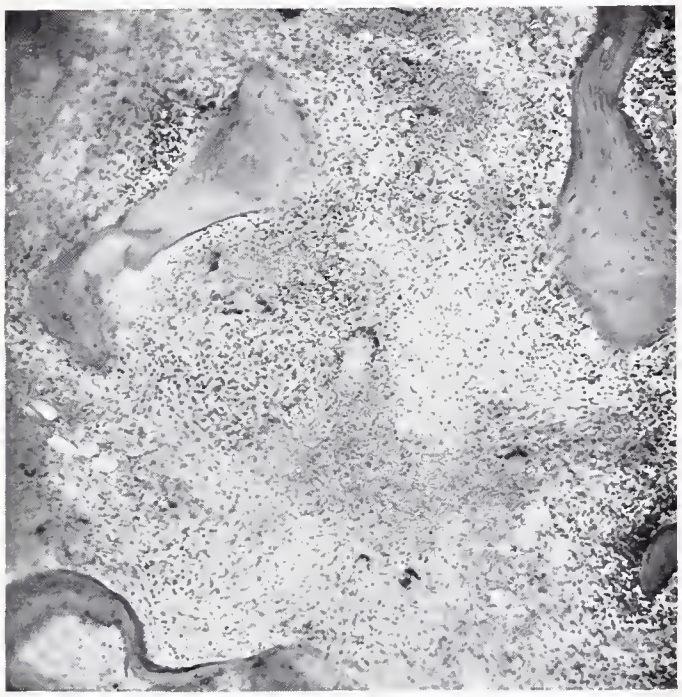


Fig. 2. Tuberculous involvement of bone marrow.

We also have a record of leukopenia, anemia and thrombocytopenia; we have a history at one time of a skin rash, erythematous in type, which apparently disappeared in later stages of the disease and we have at least transient splenomegaly and albuminuria as well as arthritis, all of which fits into the picture of disseminated lupus.

We do not have any information as to whether or not lymphocyte and epithelioid cells were found in the bone marrow. The bone marrow in the cases of lupus I have seen are usually agranulocytic and the tendency toward lymphocytosis that is shown here is rather unusual. Nearly all of the lupus cases that I have seen, even those that had rather marked leukopenia—and most of them do have leukopenia—there has been a granulocyte preponderance which is not shown in the bone marrow of this case. The anemia, while it can happen in lupus, is usually not so severe except late in the disease but the anemia in this case lasted for nearly two years. I think, therefore, that while lupus is worthy of consideration there are some things against it and so in summary I would say that it looks like we have a bone marrow injury that might have been due to sulfa drugs, some type of pneumonitis which might be associated with tuberculosis, although the apices here are rather remarkably spared and the possibility of a neoplasm of the lung and metastasis must be kept in mind.

R. O. Muether, M.D.: Do you think this case would be compatible with hypersplenism?

Dr. Broun: Yes, I would say that it would be compatible with splenic panhematocytopenia but, while there is recorded a transient splenic enlargement, most of the time when one has splenic panhematocytopenia one has a definite splenomegaly. I think sulfa drugs can cause a direct marrow aplasia which is what we seem to have here or that it occasionally can cause abnormal splenic action, more particularly a hemolytic anemia which I have seen cured by splenectomy.

AUTOPSY FINDINGS

H. T. Blumenthal, M.D.: Gross examination showed a fairly well developed, poorly nourished white female who appeared older than her 56 years. Gross examination was essentially normal except for several decubitus ulcers over the sacrum and heels. Pleural cavities were free of fluid but there was 400 cc. of straw colored fluid containing flecks of fibrin in the peritoneum cavity and 100 cc. of similar fluid in the pericardial cavity. The serosal surface of the intestines and the pericardium of the heart were studded with many grayish white pinpoint areas and streaks of fibrinous exudate. Numerous firm fibrous adhesions were present over the apices of both lungs. The right upper lobe was consolidated completely and covered on its visceral pleura by numerous pinpoint areas similar to those noted before. One section of this lobe had a firm gray, dry surface. The remaining portions of the lung showed only moderate edema and congestion. The surface of the liver was studded with many small gray nodules which also were seen scattered through the parenchyma of the liver. Similar nodules were present also on the capsular surface and within the substance of the spleen. The spleen was moderately enlarged, weighing 400 gms. The kidneys showed several V shaped scars indicative of chronic pyelonephritis, but the remainder of the genito-urinary system was not unusual. The small bowel was distended from the duodenum to a point approximately 15 cm. proximal to the ileocecal valve where a fibrous band apparently was producing partial obstruction by compressing the bowel. Distal to this area the bowel was collapsed.

Microscopically the small gray nodules were all

typical of tuberculosis, showing masses of epithelioid cells with scattered giant cells and a peripheral ring of lymphocytes. These were present on all serous surfaces and within the lungs, liver, spleen, adrenal, hilar lymph nodes, terminal ileum and bone marrow. The spleen also showed hemosiderosis, probably due to multiple transfusions, and the kidneys showed a rather typical pyelonephritis.

I would direct your attention particularly to the lungs and bone marrow. In addition to the tuberculous reaction noted previously, there were many areas in the lung characteristic of an organizing pneumonitis, and the x-ray findings were perhaps more typical of this lesion than of tuberculosis. Undoubtedly, this patient had had numerous bouts of pneumonia which responded from time to time to antibiotics. Perhaps the tuberculosis was also held in check for a time by antibiotic therapy, otherwise the terminal picture might have been more typical of a tuberculous pneumonia.

I find particularly pertinent Dr. Broun's remarks concerning cases he has seen of apparent panhematocytopenia with tuberculosis. Since there was tuberculous involvement of bone marrow similar to that seen in many of the viscera (fig. 2) I feel that the primary etiology of the hematologic findings is probably due to tuberculosis. One must, however, hold some reservations since even at autopsy only a limited number of bones are examined and one gets only a limited idea of the overall state of the bone marrow. Reaction to sulfa drug or to the insect bites cannot be ruled out with certainty.

PATHOLOGIC DIAGNOSIS

Military tuberculosis with bone marrow involvement.

CERVIX EXAMINATIONS URGED FOR EARLY CANCER DETECTION

A woman who has an ideal cancer detection examination of the cervix with no abnormal findings may be reasonably sure that no clinically important cervical cancer will develop within six months, and perhaps longer.

This opinion was expressed by Dr. Howard W. Jones, Jr., Baltimore gynecologist, writing in the July 28 *Journal of the American Medical Association.*

Dr. Jones said an "ideal" examination should consist of a smear study, microscopic examination of tissue removed from an abnormal tissue, feeling and a history-taking.

He pointed out that cancer of the cervix is responsible for about one out of every seven female cancer deaths. Cervix cancer, he said, in many instances has an insidious development and when symptoms appear the disease is far advanced.

Consequently, he stressed the importance of smear and biopsy studies in cases of abnormal cervixes where no symptoms have developed. Inspection alone is not a reliable diagnostic method for small cancers, he said.

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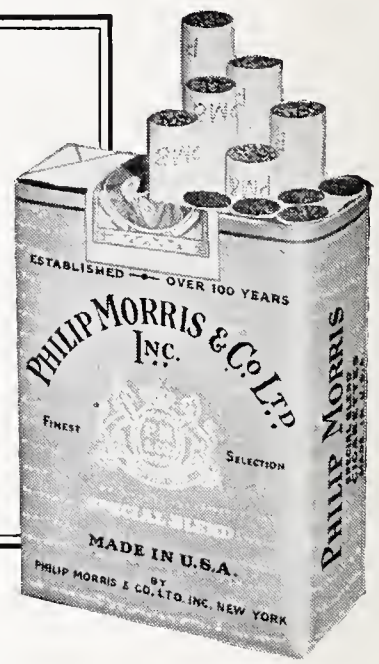
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Case Reports

PNEUMATURIA IN DIABETES MELLITUS

EDWARD W. CZEBRINSKI, M.D.
ST. LOUIS
AND
MICHAEL M. KARL, M.D.
ST. LOUIS

Pneumaturia, the expression of gas in the urine during micturition, is a phenomenon that is encountered only rarely. To the internist, it is of interest not only as an unusual urinary symptom but also as a complication of diabetes mellitus that presumably might hinder satisfactory control of the primary disease.

Pneumaturia has been classified[1, 2, 3] into three general groups:

1. Introduction of gas into the urinary tract by instrumentation, such as catheterization.

2. Introduction of gas into the urinary tract through a fistulous opening.

3. Formation of gas within the urinary tract by itself (primary pneumaturia). Primary pneumaturia may or may not be associated with glycosuria.

A case report falling into the third group is presented because of the extreme infrequency of this condition.

REPORT OF CASE

W.H.H., a 45 year old white male, was admitted to St. Louis City Hospital on November 10, 1948, complaining of passage of air through his urethra while urinating.

This patient was known to have had diabetes since 1940, at which time he was admitted to the St. Louis City Hospital for the first time in diabetic ketosis and coma, apparently precipitated by acute right ethmoiditis and right sphenoiditis. The clinical course was further complicated by the development of an extradural right frontal abscess with secondary right optic atrophy. He had previously lost the sight in his left eye due to trauma at the age of 14.

From 1940 until 1948, he had been followed in several diabetic clinics in St. Louis, apparently doing well until March 1948 when he began to have frequent intermittent passage of air through his urethra while urinating. No other urinary symptoms were noted.

Physical examination revealed the following significant features: Temperature, pulse and respirations were normal. The blood pressure was 200/130. Both pupils failed to react to light; the right was larger than the left. Funduscopic examination revealed a lens opacity on the left and optic atrophy on the right. The chest was clear to percussion and auscultation. The heart was slightly enlarged to percussion. The rhythm was regular. A soft apical systolic murmur was present. Abdominal examination revealed no masses or palpable organs. There was a two plus soft pitting edema of the lower extremities. Rectal examination revealed slight enlargement of the prostate.

Urinalysis showed cloudy urine with a specific gravity of 1.010, acid reaction with a pH of 6.0, four plus albuminuria and a negative test for sugar. The uncentrifuged specimen contained many pus cells. A gram stain demonstrated streptococci and gram negative bacilli. Aerobacter aerogenes resistant to penicillin and sensitive to from 4 to 15 micrograms of streptomycin per cc. were cultured from the urine.

A persistent anemia of 2.75 million red blood cells with 8.0 grams of hemoglobin was found. The white count varied from 4,650 to 8,600 with normal differential counts. Serum albumin varied from 2.43 to 3.33 grams per cent, and serum globulin ranged from 2.53 to 3.07 grams per cent. The albumin-globulin ratio varied from .79 to 1.13. The blood sugar levels ranged from 200 to 500 milligrams per cent. The blood urea nitrogen was 14 milligrams per cent.

The patient's albuminuria persisted. A urine concentration test revealed that the patient was unable to concentrate to more than 1.012.

The diagnoses of diabetes mellitus, intercapillary glomerulosclerosis, cystitis and pneumaturia were made.

In investigating the pneumaturia, the following facts were noted. Gurgling noises could be heard and bubbles could be felt along the course of the membranous urethra when the patient urinated. Submersion of the penis, with and without a urethral catheter in place, into water revealed bubbles of gas passing from the urethra into the water. Barium enema and proctoscopic examinations failed to demonstrate the presence of fistulas. No fecal contents were ever found in the many urinalyses.

Cystoscopic examination showed an edematous bladder mucosa with small hemorrhagic areas, most of which contained small gas bubbles. There was mild trabeculation of the bladder wall. The ureteral orifices were edematous. The lumen of the bladder neck was narrowed by prostatic enlargement (grade 2). Urethral and bladder urine cultures revealed A. aerogenes. Fungus and yeast cultures were negative. Retrograde pyelography was normal. X-rays of the bladder area prior to instrumentation revealed a roughly semicircular pattern of diminished density about the bladder area, having the appearance of air. A cystogram demonstrated a normal shaped bladder with some increase in trabeculation. No evidence of filling defect, extravasation or diverticulae were seen.

During the patient's hospital stay, daily fractional urine studies failed to reveal glycosuria in spite of fasting and two hour post prandial blood sugar levels ranging from 200 to 500 milligrams per cent.

One week after admission, after catheterized and cystoscopic urine cultures had all grown A. aerogenes, the patient was given streptomycin, 0.5 gram twice daily, with sodium bicarbonate in doses large enough to maintain an alkaline urine. After two weeks of this therapy, urine cultures no longer showed A. aerogenes, but did grow E. coli. At this time pneumaturia was no longer present. The patient was given sulfadiazine, 6 grams daily, with soda bicarbonate for six days. The patient was again cystoscoped on December 10, 1948, one month after admission. At that time, the cystitis was much less severe. No air bubbles were seen but urine cultures continued to grow E. coli, and continued to show pus cells and albuminuria. Inasmuch as the patient was now completely asymptomatic from the standpoint of his urinary tract, treatment was discontinued and he was discharged from the hospital. He was interviewed again three months after discharge, at which time he reported that he had been entirely free of pneumaturia.

DISCUSSION

The first case of primary pneumaturia was described by Raciborski in 1860.[4] Keyes[5] in 1882 described the first case reported in the American literature. Kelly and McCallum[1] in 1898, in a general review of the subject, reported sixteen

From the Washington University Medical Service, St. Louis City Hospital.

cases, nine associated with glycosuria. Three case reports and reviews were added by Taussig,[6] Young,[7] Muslow and Gillies,[2] Riley and Bragdon,[8] and Arthur and Johnson.[3] From all these sources there were collected twenty-eight cases of primary pneumaturia, sixteen of which were associated with glycosuria.

Arthur and Johnson,[3] in reporting the third case of pneumaturia in a diabetic patient in the American literature to 1948, comment on the apparent rarity of this condition. It would seem that the high incidence of bladder infections by gas forming organisms in diabetic patients with glycosuria should make this phenomenon more common than is actually observed.

The composition of the gases observed has been reported as carbon dioxide, oxygen, nitrogen, hydrogen and methane.[9] In diabetic persons, the mechanism has been thought to be fermentation of sugar to carbon dioxide by such organisms as B. coli, A. aerogenes, and yeast, with formation of alcohol as a by-product.[9, 8] That the strain of A. aerogenes isolated in this case was a powerful fermenter of glucose was demonstrated repeatedly in the laboratory. In the absence of sugar in the urine, it has been suggested that gases may be formed from organisms acting on proteins or blood in the urine, or from the reaction of acid urine secreted by the kidneys on the ammonium carbonate in the bladder urine retained for long periods by some obstruction.[2] The factors playing significant parts in the production of pneumaturia would seem to be (1) urinary retention, (2) infection by some gas forming organism such as B. coli, A. aerogenes or yeast, (3) glycosuria, (4) albuminuria.

It is noted that this patient, like those of Riley and Bragdon's[8] and Arthur and Johnson's,[3] was aglycosuric despite blood sugar levels ranging from 200 to 500 milligrams per cent. It is likely that this might also have been noted in some of the earlier cases had blood sugars been performed. That this discrepancy is probably due to fermentation in the bladder rather than to high renal threshholds is suggested by the work of Arthur and Johnson[3] who found sugar in the ureteral but not in bladder specimens during simultaneous analyses. Perhaps these observations might offer an explanation for the fact that diabetic patients sometimes show a decrease in the urinary sugar when they develop cystitis. From the standpoint of the practical management of diabetes, it might be extremely misleading to depend entirely on urinary sugars for adequate control in these patients.

CONCLUSION

A case of pneumaturia in a diabetic patient associated with bladder infection due to A. aerogenes is reported, with elimination of the pneumaturia after A. aerogenes had been cleared by means of streptomycin. This is the fourth case of this type reported in the American literature.

3701 Grandel Square

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GASTROINTESTINAL HEMORRHAGE FROM A LARGE DOSE OF ACETYLSALICYLIC ACID

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ST. LOUIS
WILLIAM A. KNIGHT, JR., M.D.
ST. LOUIS
AND
GEORGE E. THOMA, M.D.
ST. LOUIS

Massive gastrointestinal hemorrhage has been reported to follow the ingestion of large amounts of salicylates. Quick[1] has criticized previous reports that salicylates were responsible for hemorrhage on the grounds that laboratory data in such reports were inadequate.

We are reporting an instance of hemorrhage subsequent to the ingestion of 1,400 grains of salicylates (aspirin) during a period of three weeks. Laboratory data and clinical examinations seem to indicate that hypoprothrombinemia was the essential factor in the pathogenesis of this hemorrhage.

CASE REPORT

Mrs. S. M. (FDH 49-1081). A 63 year old woman was seen twelve hours after vomiting large amounts of blood. She had retired for the night in apparent good health, awakened at 4:00 a. m. and vomited about a pint of dark red blood. Between 4:00 a. m. and 3:00 p. m., she vomited moderate amounts of blood six times.

For the preceding three weeks, she had been taking three aspirin tablets four and five times per day for pain from hypertrophic arthritis of the thoracic vertebrae. She had taken approximately 1,400 grains of aspirin in the three week period. After two days, she was completely free of pain, but continued to take the aspirin daily including the day preceding the hemorrhage.

Past History: Seven months previously, she had undergone a subtotal gastric resection for adenocarcinoma of the stomach. Follow-up visits to the outpatient clinic showed her enjoying good health, eating all foods, gaining weight and doing her own housework.

Physical Examination: At 4:00 p. m., June 22, 1950,

Aided in part by Grant CT 619 USPHS and American Cancer Society, Inc., Missouri Division.

From the Departments of Surgery and Medicine, St. Louis University School of Medicine, St. Louis.

the day hemorrhage had begun, examination revealed a well developed, well nourished white woman lying quietly in bed with marked pallor. Blood pressure was 100/60, pulse 110. There were several ecchymotic areas on both arms and legs but no petechial hemorrhages were found. The abdomen was soft and no masses were present. The liver and spleen were not palpable. The rectal and vaginal examinations were normal.

Laboratory Findings: Red blood count was 3,100,000, Hb. 10.6, prothrombin activity 27 per cent of normal, bleeding time 2 minutes, coagulation time 15 minutes, platelets were numerous and the tourniquet test was normal. The feces were found to contain gross and microscopic evidence of blood but no ova or parasites (table 1).

TABLE I—*Laboratory Examinations of the Blood*

Days	1	2	3	4	5
Erythrocytes Per cc.	3.1M	3.0M	3.26M	3.1M	3.4M
Hemoglobin Mg. per 100 cc.	10.6	10.8	11.0	11.4	11.0
Bleeding Time	2″	2.5″	1.5″	2.5″	2″
Coagulation Time	15″	8″	6″	4.5″	5″
Prothrombin Activity in %	27%	39%	48%	70%	81%
Platelet Count per cc.		190,000	230,000		
Leukocytes per cc.		7,900	8,500		

The clinical diagnosis was made of gastrointestinal hemorrhage, probably due to hypoprothrombinemia after massive aspirin therapy.

Roentgenologic and gastroscopic examinations of the upper gastrointestinal tract taken ten days later failed to show any evidence of varices, erosions, ulceration or tumor growths. Both these examinations were repeated the third week and again the findings were normal except for roentgenologic evidence of giant rugae confirmed by gastroscopy.

Clinical Course: Aspirin was discontinued. The patient was given 20 mg. of vitamin K daily causing the prothrombin activity to return to normal as shown in figure 1. Hematemesis ceased after twenty-four hours. The patient had as many as five grossly and microscopically bloody stools for three days. The patient's recovery was prompt and satisfactory with no recurrence of hemorrhage.

DISCUSSION

As early as 1890 Benz[2] reported examples of excessive and prolonged menstrual flow in women receiving salicylic acid. He cited from the literature instances in which salicylic acid was believed to cause abortions. Sajous and Hundley[3] during the influenza epidemic of 1918-1919 saw many patients with severe gastrointestinal disturbances, sometimes actual hematemesis, after receiving large doses of aspirin. Douthwaite[4] reported the occurrence of melena, thought by him to have resulted from the ingestion of aspirin.

Douthwaite and Lintott[5] used the gastroscope to make direct observations of the effect of ingested aspirin on the gastric mucosa; they reported results ranging from a local hyperemia to actual submucosal hemorrhage, and concluded that aspirin was a gastric irritant. Hurst and Lintott[6] reported the first case of hematemesis directly incriminating aspirin as the etiologic agent: gastroscopic observation revealed a definite sensitivity of the gastric mucosa to aspirin which was placed in the stomach under direct gastroscopic vision, with resultant hemorrhage. Paul[7] disagreed with Hurst and Lintott, and did not observe through the gastroscope the changes in the gastric mucosa in response to ingested aspirin which these authors reported.

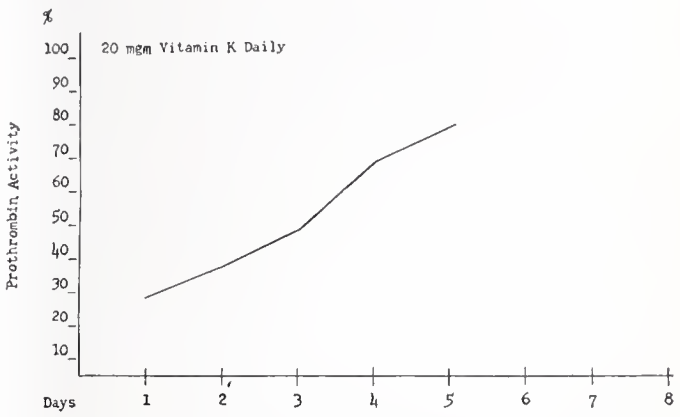


Fig. 1. Response of prothrombin activity to vitamin K therapy. Note the depressed prothrombin activity after the ingestion of aspirin.

Until 1942, it was thought by all except Paul that gastric bleeding was the result of direct trauma to the gastric mucosa by the local irritating effects of aspirin. Huebner et al,[8] were the first to attribute the hemorrhage from aspirin to a change in the clotting mechanism in the blood. Huebner showed that dicumarol, in *vivo*, underwent a chemical quantitative degradation to form salicylic acid. Link et al.[9] found that rats given salicylic acid and maintained on a low vitamin K diet would developed hypoprothrombinemia with increased prothrombin time and hemorrhagic manifestations similar to those present in "sweet clover" disease. These observations were made in human beings independently by Meyer and Howard[10] and Shapiro et al.[11] They found that oral ingestion of acetylsalicylic acid resulted in marked hypoprothrombinemia with hypocoagulability of the blood controllable by the administration of vitamin K.

Nevert[12] stated that patients receiving aspirin after tonsillectomy showed an increased prothrombin time; he believed this to be a contributing factor in postoperative hemorrhage. Ochsner[13] in discussing the causes of obscure bleeding from the gastrointestinal tract, mentioned aspirin as a probable cause by hypoprothrombinemia.

In the case under discussion, the history of ingesting approximately 1,400 grains of aspirin during three weeks with normal physical findings immediately suggested the diagnosis of gastrointestinal hemorrhoge from hypoprothrombinemia rather than hemorrhage from recurrent carcinoma or marginal ulcer. This impression was substantiated by laboratory studies, the prothrombin activity being depressed to 27 per cent of normal, with normal bleeding time and slightly elevated coagulation time (table I). These data, according to Quick, are necessary for the differential diagnosis

of gastrointestinal hemorrhage due to hypoprothrombinemia.

The common causes of gastrointestinal bleeding such as esophageal varices, marginal ulcer or recurrent cancer were excluded by repeatedly normal roentgenologic, gastroscopic and physical findings. Admittedly, a small marginal ulcer might remain undetected by these procedures, but this should not lower the prothrombin time as occurred in this case. The normal leukocyte count, platelet count and bleeding time seem to exclude the common blood dyscrasias which may result in hemorrhage.

There is considerable disagreement in regard to the relationship of the prothrombin level to hemorrhage. A prothrombin level of 27 per cent of normal as found in this patient seems sufficiently low to incriminate it as the cause for the massive hemorrhage in this patient. Wright and Rothman[14] substantiate this opinion in a report of four examples of fatal hemorrhage, three of them from the gastrointestinal tract following the administration of dicumarol in which the prothrombin levels varied between 25 per cent and 40 per cent of normal.

The hypoprothrombinemia and hypocoagulability of the blood in this patient disappeared after the administration of vitamin K. This is a clinical substantiation of the experimental work of Meyer and Howard referred to earlier in this report.

Obviously, surgical intervention to control hemorrhage in this patient might have proved fatal.

Although this is a rare complication of salicylic therapy, the extremely widespread use of aspirin, often in large doses, should make one consider salicylates as a possible cause of gastrointestinal bleeding where more common causes of bleeding have been excluded.

SUMMARY

A case of massive gastrointestinal hemorrhage following the ingestion of 1,400 grains of acetylsalicylic acid (aspirin) over a three week period is reported.

An associated severe hypoprothrombinemia appeared to be responsible for this bleeding, since other laboratory data, repeated gastroscopic and roentgenologic studies failed to show any other causative factor.

The prothrombin activity became normal and bleeding did not recur following therapy with vitamin K.

We wish to express our appreciation to Miss Patricia Thomas for her help in performing the laboratory examinations.

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TUBERCULOSIS VERRUCA NECROGENICA

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ST. LOUIS
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ST. LOUIS

Infection by the tubercle bacillus usually occurs through the respiratory tract or the gastrointestinal tract, including the pharynx and tonsils, and more rarely through wounds of the skin. The latter infection results from the direct inoculation of virulent tubercle bacilli into the skin. It occurs most commonly in individuals who are in frequent contact with tuberculous cadavers, tissues of infected animals and infectious laboratory materials. The infection is seen most frequently on the fingers and on the hands and generally at the site of a pre-existing injury or abrasion. After having gained access to the tissues through direct inoculation into the skin, the tubercle bacilli may be destroyed if the number of bacilli is small and the resistance of the host is high. In the event that the resistance of the host is inadequate, the organism multiplies and elicits a characteristic cellular response which results in tubercle formation at the point of inoculation.

The lesion appears verrucose, with a horny, papillomatous surface on an elevated, inflammatory base. Characteristic giant cells containing tubercle bacilli are found in the lesions and there may be miliary abscesses in the vascular layers of the skin. Although the lesion is more or less persistent, after a variable period of time, it usually undergoes involution. Rarely, Verruca necrogenica is followed by tuberculous lymphangitis and lymphandenitis.[1] The tubercle bacilli extend along the lymph channels to reach the lymphatic gland. The infected gland appears swollen, hard and nodular. Later, a softening occurs and the lesion may disappear gradually through absorption. Usually, however, the skin becomes involved in the caseation and suppurative changes resulting in one or

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several points of softening and destruction. Sinuses are thus formed which lead to the underlying infected glandular structures. The process may remain localized and, eventually, healing by calcification may occur. Occasionally, the process extends through the lymph node capsule to reach other lymph nodes by way of the lymphatics. Eventually the process may reach the circulatory system and result in a widespread dissemination of organism and constitutional infection.[2, 3, 4]

In a subject in whom there is a latent or manifest form of glandular, ophthalmic or similar type of tuberculosis there occurs, not infrequently, a series of symmetrical skin eruptions which have been termed "tuberculids" by Darier.[5] This condition is seldom seen in pulmonary tuberculosis.[6] The eruption consists of inflammatory lesions varying from a few millimeters to 2 or 3 centimeters in diameter. Their typical tubercle structure indicates tuberculous origin. The lesions heal leaving atrophic, noncontractile scars, often with hyperpigmented borders.

The tubercular nature of tuberculids has been admitted for many years, owing to their clinical characteristics, histopathologic structure and their frequent occurrence in conjunction with manifest tubercular lesions. It has been practically impossible to find the tubercle bacillus in scrapings or sections and animal inoculations have been almost uniformly negative. Early investigators ascribed tuberculids to the circulation of toxins absorbed from tuberculous foci or to multiple microbic emboli composed of bacilli of low virulence which rapidly succumbed to the resistive forces of the tissues.[7] Subsequent investigations by Rist and coworkers[8] led to the conclusion that cutaneous tuberculids are a manifestation of allergy of subjects in whom there is a manifest or latent form of tuberculosis. A positive cutaneous reaction was observed in all cases of tuberculids. It was demonstrated that the exogenic reinoculation of virulent organisms into an allergic subject results in a lesion which heals. The tuberculids were interpreted as resulting from endogenous reinoculation representing a spontaneous example of Koch's phenomena since the tuberculids were in all respects similar to the lesions produced by virulent exogenous inoculation. It has been noted by Laden[9] that an outbreak of tuberculids is often associated with rather sudden involution of tuberculous granulation tissue. The development of tuberculids concurrent with decomposition of tuberculous tissue suggested that the lesions result from the mobilization and entrance of bacilli into the blood stream with subsequent embolism of living, dead or fragmented bacilli eliciting an allergic response in individuals with high tuberculin sensitivity, resulting in the formation of tuberculids.

CASE REPORT

L. H., aged 33, white, a male bacteriologist, was first seen in March 1949, at which time there was a small dirty ulcer at the base of the nail of the index finger of the right hand which had been present for three weeks. It had begun as a small burn from high frequency current. It was about 3 mm. in length and extended into the deep tissues. Inflammation was present, the tissue sloughed and exuded yellow pus. After ten days a necrotic area developed under the nail and slowly progressed until it coalesced with the lesion at the base of the nail. Frequent cultures from the pus revealed gram positive diplococci and on April 1, 1949, a guinea pig was inoculated with material from the finger. The lesion of the finger was treated with penicillin and tyrothricin ointment locally and 300,000 units of penicillin was given intramuscularly each day until 3,000,000 units had been administered. The lesion would heal and then break down again. Antibiotic therapy had no effect on this cyclic course. Permanent healing of the lesion occurred in about six weeks.

Shortly after the ulcer on the finger developed, a similar lesion began in the skin of the forehead at the hair line at a point which had been accidentally abraided and was thought to be the result of direct contamination of the wound by the infected finger. This lesion, too, failed to respond to antibiotic therapy. It had a rather nondescript bacterial flora and cleared spontaneously in about six weeks.

Four weeks after the initial lesion, a series of maculopapular lesions developed on the arms and abdomen. These lesions would become fluctulant, break down, drain for a few days, and would then heal leaving a slightly depigmented area at the site. Frequent attempts to culture the pus from these pustule like lesions failed to reveal any bacteria or fungi and no bacteria could be found on direct examination of stained specimens. The skin manifestation which began in March persisted until the latter part of May and then disappeared. During the middle of March the glands in the right axilla became large and the skin over them was red. There was, however, no pain or tenderness to pressure. The glands became soft and fluctulant early in April. On April 21, 1949, 10 milliliter of a thick yellow pus was aspirated. The material was inoculated into a guinea pig and cultures made. After aspiration the swelling was diminished but the pus gradually accumulated again and on May 5, 1949, the lesions ruptured spontaneously and drained profusely for several weeks; gradually the drainage diminished, but a sinus remained which showed no indication of healing. An axillary dissection was done on June 28, 1949, and the involved gland sinus tract was removed *en masse*. The skin was closed without drainage and healing by first intention occurred.

Laboratory Studies: On March 8, 1949, the erythrocyte count was 4,410,000 per cu. mm.; hemoglobin 15.8 gm. per 100 c.c.; sedimentation rate 26 mm. per hour; leukocyte count 6,700 per cc.; Schilling differential: juveniles 2 per cent, stabs 6 per cent, segmented 58 per cent, lymphocytes 28 per cent, monocytes 1 per cent, eosinophils 2 per cent, and basophils 2 per cent. Aerobic and anaerobic blood cultures were negative. In the culture of material from the ulcer a gram positive diplococcus was isolated which grew well on all media. No acid fast organisms were found on direct smear or culture. A guinea pig inoculated on April 1, 1949, with material from the ulcer on the finger, was killed on July 2, 1949, and autopsy revealed an enlarged spleen with necrotic areas. Liver, lungs and kidneys were not involved. Stained smears of the splenic pulp revealed acid fast rods (Ziehl-Neelsen stain). One milliliter of pus which had been aspirated from the axillary on April 21, 1949, was injected into the peritoneal cavity of a 150 gm. guinea pig. The pig died on May 22, 1949, and acid fast rods were again found in large numbers.

Repeated examination of blood counts showed no marked change from the original. X-ray examination

of the chest revealed small areas of calcification but no signs of active infection. Subsequent examination revealed no change. The pathologic diagnosis on the gland removed was tuberculosis.

The patient had been working on a problem involving tubercle bacilli and the following data indicates the length and duration of exposure:

Groups of mice were inoculated intravenously with Mycobacterium tuberculosis on December 24, 25, 26, and 27, 1948. The experiment extended through January 15 at which time all surviving animals were sacrificed. During the course of the experiment there existed conditions of contact with the organism since feeding vessels were removed and filled daily. The cages were cleaned at biweekly intervals.

The strain of Mycobacterium tuberculosis used was one that had been isolated from a case of tuberculous meningitis, June 2, 1948, and stored in the refrigerator for three months. It was then transferred twice on egg yolk media then inoculated into Dubos'Tween-albumin media. After three weeks cultivation the organisms were used as the inocula in the animal experiments described.

DISCUSSION

The occurrence of a tubercle following exposure of the injured area to virulent tubercle bacilli parallels the expected sequence of events. Interest in this case is focused on the axillary lymphadenitis which followed the primary lesion, on the repeated occurrence of bacteria-free maculopapular lesions resembling tuberculids, and on the prompt healing which followed surgical treatment with the removal of the axillary lymph nodes.

The extension of the infection from the primary lesion to the axilla may be attributed to an inadequate state of resistance on the part of the patient or to an enhanced invasiveness of the infective agent. Since the strain of tubercle bacilli to which the patient was exposed had been isolated recently from a case of meningitis, it might be postulated that this organism possessed maximum invasive properties. The chronic course and eventual localization of the infection indicated the resistant state of the patient.

The outbreak of maculopapular lesions which accompanied the axillary lesions could not be attributed to the presence in the eruptive pustules of an infectious agent. The absence of microorganisms as evidenced by direct microscopic observation and by cultural tests of pus from the pustules suggested that their origin was related to the hypersensitive state of the patient as evidenced by his positive reaction to tuberculin. A histologic examination of the pus was not made. This was unfortunate since the final criterion for admission into the category of tuberculids is a histologic resemblance of the lesion to that recognized for tuberculosis.

SUMMARY

1. Local tissue damage from electrical burn apparently allowed invasion of tubercle bacilli.

2. Relatively high resistance limited the infection to local glands.

3. The focus of infection produced an allergic like reaction as manifested by the "tuberculids."

4. Adequate drainage and final removal of infected gland *en masse* resulted in prompt disappearance of all skin lesions and led to the cure of the patient.

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MULTIPLE SCLEROSIS VICTIM'S OUTLOOK BETTER THAN BELIEVED

The course of multiple sclerosis is not as grim as it is generally believed, according to Drs. Alexander R. MacLean and Joseph Berkson of the Mayo Clinic, Rochester, Minn.

These two physicians presented a hopeful picture in the August 11 *Journal of the American Medical Association*. Their opinion was based on at least a 10 year follow-up of 406 cases diagnosed at the clinic over a six year period, 1934 through 1939.

At the end of five years, 93 per cent of the patients were living; at the end of ten years the survival rate was 79 per cent, their report showed. The five year survival of a normal group of the same age is about 98 per cent; the ten year rate 93 per cent.

"This is to say that the ten year survival rate for this group of patients with multiple sclerosis is about 85 per cent of the rate for a normal population," the report commented. "Similarly, the five year survival rate for the multiple sclerosis group is 95 per cent of the normal rate for this period.

"Thus, this group of patients with multiple sclerosis had almost a normal survival rate in the five years following their visits to the clinic and even after ten years it was reduced only to about 85 per cent of normal."

Of the patients coming into the clinic for treatment, there were 278 able to work and walk on their first visit and on whom a ten year follow-up was obtainable. Of these, 64 per cent were able to work and walk at the end of five years and 42 per cent at the end of ten years.

Multiple sclerosis usually attacks young people, mostly those between the ages of 20 and 40. The cause is unknown. It attacks the central nervous system. Among its symptoms are impaired vision, lack of balance, weakness and numbness, difficulties with speech and emotional upsets. The disease has periods of improvement, only to be followed by renewed attacks with progressive disabilities.

Their study, they added, was undertaken to provide an adequately established estimate of the prospects which could be used as a basis to judge the results of treatment.



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PRESIDENT'S PAGE

Once again the possibility of establishing a Grade A four-year University of Missouri Medical School is being investigated by a House Committee of the Legislature. Several of us have met with the members of this Committee and our impression of them is that they are a group of hard working, conscientious men striving to solve a problem which has confronted the state for more than thirty-five years. The Legislative Committee hearings are to be continued, and we wish the Committee luck in untangling the welter of statements for and against such a school and where to put it. In view of the existing confusion and to keep the record straight, I would like to point out briefly the aims, interests and convictions of the Missouri State Medical Association in this perennial problem.



First, I think everyone will agree that our need is not one of obtaining more physicians for St. Louis or Kansas City but for rural Missouri. It is trite to recall that there are large areas in Missouri where there are no physicians and many others where they are too few or they are too old for active practice, and this we would move to correct. In our pride of achievement and knowledge of the ability of the well trained physician and what he has to offer, many of us resent Missouri's being considered the mecca for so-called physicians "of lesser ability."

This latter condition brings up my second point, that we would rather have no medical school if we cannot establish and maintain one of the highest standard, whose graduates can successfully compete with the best graduates from anywhere. This caliber of school we contend can be obtained only by placing it in a metropolitan center where there is a large available pool of indigent patients of all types, not just those with chronic diseases, and where there is available a large group of physicians for part time practical instruction.

And for this moment in medical history such a school should be pointed toward production of capably instructed general practitioners. This has been pointed out by the Committee on Rural Medical Service, a Committee composed of physicians working in rural Missouri who know the needs of their communities and the value of the general practitioner in their communities.

Thirdly, we think that the primary purpose of the University is to educate physicians and not to practice medicine. The system we envision is one whereby the State University would educate physicians, and the Medical Association cooperating with the Public Health Authorities, the Hill Burton Act, and the responsible citizens of alert communities, would attempt to establish suitable working facilities in all communities where they are needed and obtain graduates from this state to man them.

And lastly, we, knowing the high cost of medical education, and as taxpaying citizens, see the necessity that this school be established on the most economical construction and maintenance basis possible. Financially, it must be kept within the state's ability to build and maintain without increased taxes and without exhausting the funds available to the other educational departments. The Medical Association believes the people deserve and should receive only the best medical care, and again we offer the cooperation of the Missouri State Medical Association to everyone interested in the problem.



Editorials

THE INDUSTRIAL WORKER AND LIFE EXPECTANCY

An industrial wage earner, starting his work at the age of 20, today can expect approximately 48.4 additional years of life, or to live to the age of 68. Forty years ago, the industrial worker could expect an average of only 36.9 additional years to reach an age of 57. Dr. Louis I. Dublin, of the Metropolitan Life Insurance Company, in an address before the American Public Health Association, gave interesting information on the increase of the life span of the industrial worker in the United States.

Physicians have shared in bringing about the improvement with engineers, chemists and many others. Today, industrial medicine is a well organized field to meet the needs of industry but also knowledge of the cause of accidents, not only in the medical field, has increased greatly and the means to prevent them have increased greatly. Industrial plants are more and more built to give the worker more light, air, more protection and better working conditions. Hours have been shortened and the economic status of the worker improved, all of which has reflected in improved health and longer life.

Dr. Dublin points out that forty years ago accidents, crowded working conditions, bad plant sanitation, uncontrolled dusts, fumes and gases and long hours of work made the industrial worker susceptible to tuberculosis and any infection to which he might be exposed. However, with all improvements, the white industrial worker still has a high mortality and shorter life expectation than other workers although the difference is less than it was forty years ago. Based on 1948 figures, the industrial male worker of 20 had one year less life expectation than the agricultural and white collar workers.

Notable gains have been made for each decade of life as well as for the younger age. At age 30 the expectation of life in 1949 was 39.06 years, 9.7 years more than in the earlier period; at age 40 the expectation was 29.94 years, a gain of 7 years; at 50 the expectation was 21.77 years, a gain of 4.8 years, and at age 60 the expectation was 14.90 years, a gain of 3.4 years. Even since 1940, the expectation of life of a worker aged 20 has increased two and one half years.

Mortality rates during the working ages, 20 to 64 years, for males, in 1948-1949 was 6.7 per 1,000, only about two fifths of what it was in 1911-1912, 17.4 per 1,000. The tuberculosis death rate in this group has decreased from 433.5 per 100,000 to 42.3, or a decerase of more than 90 per cent. Mortality from influenza and pneumonia has decreased almost as much but in the overall picture, accident mortality has declined 56 per cent. Deaths from cardiovascular-renal diseases declined approximately one third, as did those from diabetes. Cancer mortality has increased 25 per cent.

While Dr. Dublin points out that the picture at present is encouraging, he regrets that one cannot accurately appraise the specific factors that have brought about this improvement. The elimination of occupational health and accident hazards and the control of others have had a big part. But other factors, medical, as well as economic and social, have had a large part.

KOREAN WOUNDED HAS BETTER CHANCE THAN VICTIM OF CIVILIAN ACCIDENT

A wounded member of the United Nations in Korea entering a military hospital has a better chance of survival than a civilian accident victim who is taken to a large municipal hospital, according to Major General Edgar Erskine Hume, chief medical officer of the United Nations Forces in Korea.

Deaths among hospitalized service men in Korea have run at about half of the record low rate in World War II. In that war, about 955 of every 1,000 men taken to a military hospital lived, whereas the Korean survival rate has risen to 975. General Hume points out that municipal hospitals in large cities, those that care for the victims of ordinary accidents due to traffic, industry and the like, can hardly match these figures.

This record has been attained despite the difficulties incident to administering a medical service to soldiers, sailors and airmen of more than a score of nations, with different languages, diets and religions.

"One must see the smoothness with which this united medical service functions to believe it possible," General Hume says in an article in a recent issue of *The Journal of the American Medical Association*. He says: "We make no distinction in our hospitals as to the nationality, race, rank or religion of our patients. They are separated solely on the basis of their clinical condition. Not once has there been any difficulty or complaint regarding this policy. No physician, civil or military, can be other than satisfied to see a general in the bed next to a private, a Frenchman beside a Filipino, or a Negro in a bed adjoining that of a man of some other race. We hold that nowhere is the spirit animating the United Nations more manifest. When requested, we provide special food for those whose dietary rules or national usage specifies a particular diet."

General Hume said that while other nations have sent small medical groups along with their contingents, the medical service is dependent largely upon American personnel.

Organization and Economics

NEWS NOTES

James R. McVay, M.D., Kansas City, was re-elected Chairman of the Council on Medical Service of the American Medical Association at a meeting on August 4. This is Dr. McVay's fourth consecutive chairmanship of the Council.

Edwin C. White, M.D., Kansas City, has been reappointed to the Board of Medical Examiners and W. J. Shaw, M.D., Fayette, has been appointed on the Board.

W. H. Allen, M.D., Hume, was honored by his town and community at a potluck supper and program in the Legion Hall, Hume, on July 10.

Melvin A. Casberg, M.D., St. Louis, Dean, St. Louis University School of Medicine, has been appointed chairman of the Section on Military Medicine of the American Medical Association.

The third annual meeting of the Southwestern Surgical Congress will convene in St. Louis, September 24 through 26, with headquarters at Hotel Jefferson.

Roy V. Boedeker, M.D., St. Louis, will speak on "Practical Procedures in Gynecology for Treatment in the General Practitioner's Office" at a meeting of the General Practitioners Study Club, 1950 Uceyle Ave., Overland, at 9:00 p. m. on September 19.

MUSINGS OF THE FIELD SECRETARY

If there has been developed in rural Missouri a satisfactory, or even near satisfactory, plan or program for the medical, surgical and hospital care of the medically indigent, it might be well if the baskets were lifted and the lights permitted to glow.

On September 26, at the Governor Hotel, Jefferson City, 10:00 a. m. to 3:00 p. m., the Missouri Health Council will attempt to shed a ray of light on this problem by sponsoring a discussion meeting of people representing specific groups in Missouri who are most directly concerned with the subject. The major objective of this session will be to explore the problem by having short formal presentations from various organizations and individuals relating to the phases of the problem with which they are concerned. These are to be followed by a general discussion, with all present invited to participate, under the direction of a competent moderator. This meeting is open to the public and harbors a secret desire that many doctors over the state may be present. The outcome of this conference and subsequent developments in this important phase of professional concern may lead in one of several directions—conceivably in a wrong one if proper guidance is not forthcoming.

Under the recently amended state Health Center Law, it is reasonable to assume that a number of additional counties will be voting on a tax proposition for the establishment of a County Health Center (formerly termed health department or unit and financed and administered from general revenue by the county court). The function of the County Health Center, by law, is to carry on recognized and generally accepted public health work. The professional personnel employed to carry out this work must meet minimum qualifications as set up by the State Division of Health. Under the new law, the Health Center will be administered by a board of five citizens of the county, elected by the voters on a nonpartisan basis for staggered terms. This health center law is designed to operate, primarily, with local county funds and from local authority.

On Thursday night, September 20, at an organizational meeting at the Strand Hotel in Chillicothe, a new hyphenated society composed of physicians from seven counties is scheduled to be born. The societies involved are Caldwell-Livingston, Grundy-Daviess, Harrison, Linn and Mercer. A committee from this group is now drawing up a proposed constitution and by-laws and searching for a suitable name, all to be submitted for consideration and action by the members of the aforementioned societies. C. Edgar Virden, M.D., Kansas City, President of the Missouri State Medical Association; H. E. Petersen, M.D., St. Joseph, Secretary; Victor Buhler, M.D., Kansas City, Chairman of the Council; Donald M. Dowell, M.D., Chillicothe, Councilor of the First District, and other Association officers plan to be present on this important occasion.

NEW MEMBERS

Campbell, James E., M.D., Macon, Mo.
Griffith, John A., Jr., M.D., Kansas City, Mo.
Griffith, John K., M.D., Independence, Mo.
Jaeger, Joseph N., M.D., Jackson, Mo.
Marshall, Homer C., M.D., Springfield, Mo.
Rosen, Max, M.D., Springfield, Mo.
Tabris, Julius A., M.D., Kansas City, Mo.

DEATHS

Stone, Murray C., M.D., Springfield, a graduate of Harvard Medical School, 1903; Fellow of the American Medical Association; member and past president of the Greene County Medical Society; aged 71; died June 12.

Griffin, Fred, M.D., Mexico, a graduate of Washing-

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* Hamblen, E. C.: Some Aspects of Sex Endocrinology in General Practice, North Carolina M. J. 7:533 (Oct.) 1946.

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ton University School of Medicine, 1904; member and past president of the Audrain County Medical Society; aged 71; died June 20.

Sturhahn, Ferdinand O., M.D., Webster Groves, a graduate of St. Louis College of Physicians and Surgeons, 1891; honor member of the St. Louis Medical Society; retired; aged 86; died July 20.

CANCER PROGRAM

The consulting staff of the Ellis Fischel State Cancer Hospital, Columbia, will meet at the Hospital on September 16. The scientific program to be presented is "Diagnosis and Treatment of Gastric Retension," Paul A. Knepper, M.D., St. Joseph; "The Role of Radioactive Iodine in the Management of Thyroid Carcinoma," George Miles, M.D., Kansas City, and "Carcinoma of the Cervix," William T. Moss, M.D., Columbia.

KANSAS CITY SOUTHWEST CLINICAL SOCIETY

The twenty-ninth Annual Fall Clinical Conference of the Kansas City Southwest Clinical Society will convene October 1 through October 4. Daily medical and surgical round table luncheons, with distinguished guests participating in question and answer periods; a clinicopathologic conference; an entertainment; panel discussions and sectional lectures will make up the session.

Among guest speakers at the session will be Drs. Edward F. Bland, Boston; Verne R. Mason, Beverly Hills; H. Marvin Pollard, Ann Arbor; John W. Cline, San Francisco; Warren H. Cole, Chicago; Mims Gage, New Orleans; Herman E. Pearse, Rochester, N. Y.; A. W. Adson, Rochester, Minn.; Ross Golden, New York; William F. Mengert, and Harold A. O'Brien, Dallas; Heyworth N. Sanford, Chicago; George Saslow, St. Louis; J. R. Schenken, Omaha; I. S. Tassman, Philadelphia, and Edward B. Tuohy, Washington, D. C.

Missouri State Medical Secretaries and Assistants Society

The Missouri State Medical Secretaries and Assistants Society held their second meeting as a luncheon meeting at the Clifford Tea Room, Fayette, on June 24. Twenty members were present representing Kansas City, Jefferson City, Fulton, Sedalia, Moberly, New Franklin, Boonville and Fayette. Hostesses at the meeting were Mrs. Mary K. Shell, Mrs. Jane Dougherty and Mrs. Lucille Meyer.

W. A. Bloom, M.D., Fayette, immediate Past President of the Missouri State Medical Association, addressed the group, complimenting them on the formation of the group and pointing out the importance of the secretary and assistant in the medical field.

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Members attending the Fayette meeting of the Missouri State Medical Secretaries and Assistants Society. First row: Miss Ruth Rowen, Kansas City; Mrs. Lucille Meyer, Fayette; Mrs. Virginia Herrin, New Franklin; Miss Catherine Rand, Kansas City; Miss Amy Shock, Jefferson City; Miss Alta Bingham, Kansas City; Mrs. Mary K. Shell, Fayette; Miss Marie Oates, President, Kansas City; Dr. W. A. Bloom, Fayette. Standing: Mrs. Helen Middleton, Columbia; Miss Dorothy Hansen, Fulton; Mrs. Wilma Zumwalt, Columbia; Mrs. Bertha Welch, Sedalia; Miss Linda Martinez, Kansas City; Miss Betty Brock, Moberly; Miss Imelda Kraus, Boonville; Miss Estelle Lammers, Boonville; Mrs. Jane Dougherty, Fayette.

Miss Marie Oates, Kansas City, president, presided at the business meeting. The state pin was displayed and a constitution and by-laws was read which will be sent to all members of the society. Miss Ruth Rowen, president of the Jackson County society, presented the state society with a check for $100.00 from the Jackson County society.

The following councilors were appointed: Miss Catherine Rand, Kansas City; Miss Betty Brock, Moberly; Mrs. Helen Middleton, Columbia; Mrs. Wilma Zumwalt, Columbia; Mrs. Bertha Welch, Sedalia; Miss Linda Martinez, Kansas City; Miss Estelle Lammers and Miss Imelda Kraus, Boonville.

It was announced that a society had been organized in Springfield with a membership of forty-three and one in Jefferson City.

Following the business meeting, the group were given a tea at the home of Dr. and Mrs. W. A. Bloom.

The next meeting will be held in Jefferson City on September 9. Reservations should be sent to Miss Amy Shock, 425 Madison Street, Jefferson City.

SOCIETY PROCEEDINGS

SIXTH COUNCILOR DISTRICT

R. W. KENNEDY, MARSHALL, COUNCILOR

Saline County Medical Society

The Saline County Medical Society honored one of its members at a dinner meeting at Arrow Rock State Park on Wednesday evening, August 1. C. L. Lawless, M.D., Marshall, who recently completed fifty-two years of medical practice, was the recipient of this accolade.

The principal address of the evening was given by R. Emmet Kane, M.D., St. Louis, who was a classmate in medical school of Dr. Lawless at St. Louis Medical College, where both were graduated in 1899. Dr. Kane, in his inimitable way, highlighted his interesting talk with many anecdotes from those medical school days back in the late nineties.

JAMES A. REID, M.D., Secretary.

NINTH COUNCILOR DISTRICT

E. C. BOHRER, WEST PLAINS, COUNCILOR

South Central Counties Medical Society

The South Central Counties Medical Society met July 19 for a picnic at the summer camp of Dr. C. W. Cooper, south of Thayer on the Spring River in Arkansas. The following members and their wives were present: Drs. R. W. Denney, H. G. Frame, S. W. Connor and A. C. Ames, Mountain Grove; Garrott Hogg, Jr., Cabool; E. C. Bohrer and C. F. Callihan, West Plains; C. W. Cooper, Thayer; A. F. Walker, Mammoth Springs, Arkansas.

After swimming, target shooting, horse shoe pitching and shuffleboard, a bountiful dinner was served by Mrs. Cooper. Following dinner Dr. Walker showed pictures which he had taken while in service in islands southeast of the Philippines and discussed yaws.

A. C. AMES, M.D., Secretary.

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Surgical Anatomy & Clinical Surgery, Two Weeks, starting September 24, October 22, November 19.
Surgery of Colon & Rectum, One Week, starting September 17, October 15.
Esophageal Surgery, One Week, starting October 15.
Thoracic Surgery, One Week, starting October 8.
Gallbladder Surgery, Ten Hours, starting October 22.
Breast & Thyroid Surgery, One Week, starting October 1.
General Surgery, One Week, starting October 1.
Fractures & Traumatic Surgery, Two Weeks, starting October 8.

GYNECOLOGY—Intensive Course, Two Weeks, starting September 24, October 22.
Vaginal Approach to Pelvic Surgery, One Week, starting September 17, November 5.

OBSTETRICS—Intensive Course, Two Weeks, starting November 5.

MEDICINE—Intensive General Course, Two Weeks, starting October 1.
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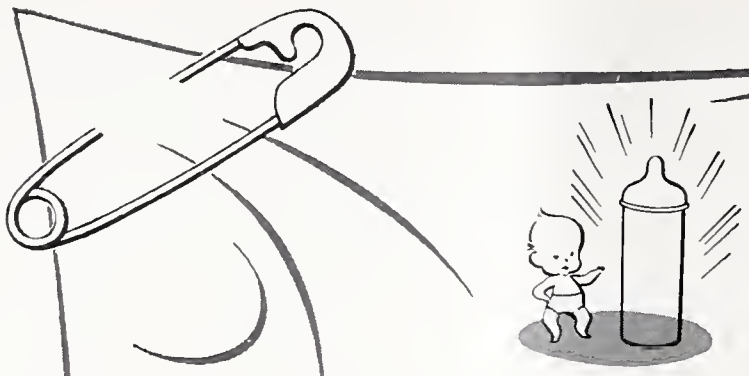
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References:

1 Krantz, Kibler and Bell: "The Neutralization of Gastric Acidity with Basic Aluminum Aminoacetate," J. Pharmacol. and Exper. Therap., 82:247 (1944).
2 Paul, W. D., and Rhomberg, C.: "Medical Management of Uncomplicated Peptic Ulcer," J. Iowa M. Soc. 35:167-85 (1945).
3 Holbert, J. M., Noble, Nancy, and Grote, I. W.: J.A.Ph.A., Scientific Edition, 36:149 (1947).
4 Holbert, J. M., Noble, Nancy, and Grote, I.W.: J.A.Ph.A., Scientific Edition, 37:292-294 (1948).

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Head Pain as a Diagnostic Lead

Frequently the presence of head pain is overlooked. The physician learns of it only if he has made an effort to elicit the information. Since the etiology of the pain is the basis of rational management, the patient should be warned against taking medication before diagnosis is made.

Friedman[1] deplores the tendency to call any chronic recurring headache migraine. Careful history-taking and full physical and neurological examinations are essential for accurate diagnosis. A good starting point is a description of the headache — its character, laterality, frequency and intensity.[2]

The following chart gives briefly the primary diagnostic leads and treatment for the most common types of headache.

Etiology of Headache	Primary Diagnostic Data	Primary Therapy
Inflammatory e.g., Meningitis Abscess	Inflammation of intracranial structures; fever; leucocytosis; bacteriologic diag.	Specific: sulfonamides and antibiotics. Symptomatic: analgesics.
Tumor	Pain varies as spinal press. changes; skull X-ray.	Specific: surgery. Symptomatic, analgesics &/or hypnotics.
Sinusitis	Sinus congestion and infection; cloudy X-ray.	Specific: antibiotics and drainage. Symptomatic: analgesics.
Hypertensive	Hypertension present but pain not related to b.p. level; Dihydroergotamine. relieves pain.	General hypertension therapy; sedation. Symptomatic: analgesics.
Migraine & other vascular headaches	Headache: recurrent, intense, throbbing. No organic causation; migraine in family; patient: energetic, perfectionist. Visual prodromata; g-i. upset during headache.	To abort attack: oral ergotamine plus caffeine. General: adjustment to minimize nervous stress.

Data here tabulated is from: Wolf, G., Jr.,[3] and Friedman, A. P.[4]

Cecil[5] ranks vascular headaches, e.g., migraine and tension headaches, as the most commonly encountered of all. Because of their functional nature and usual recurrence at frequent intervals, they present a long-term therapeutic problem.

Therapy is conducted along two lines:

1) Psychotherapy to reduce the frequency of attacks. This consists mainly of advice on emotional adjustment to stressful situations and guidance toward a good balance between work and relaxation.

2) Treatment of the distressing attack to prevent the usual period of incapacitation. Many investigators have reported that ergotamine preparations are effective for relief of the acute migraine attack in 80% of cases.[1,6] *The drug is given immediately when an attack is approaching and dosage adjusted to the needs of the individual.*

1. Friedman, A. P. and von Storch, T.: 99th A.M.A. Sessinn, June 1950. 2. Butler, S. and Hall, F.: M. Clin. N. Amer., p. 1439 (Sept.) 1949. 3. Wnlf, G., Jr.: M. J. 54:25, 1951. 4. Friedman, A. P. and Conn, H. T.: Current Therapy, 1950, p. 563; Saunders Co., Phila. 5. Cecil, R. L.: A Textbook nf Medicine, ed. 7, 1948, p. 1483; Saunders Co., Phila. 6. Horton, B. et al: Staff Meet. of Mayo Clinic 20:241, 1945.

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1. *Bauer, Gunnar: Nine Years' Experience with Heparin in Acute Venous Thrombosis. Angiology, Vol. 1, No. 2, (Apr.) 1950.*

2. *Smiles, William J.: Long-Acting Heparin Preparation: A Useful Adjunct in Anticoagulant Therapy. U. S. Armed Forces Med. J., Vol. II, No. 1 (Jan.) 1951.*

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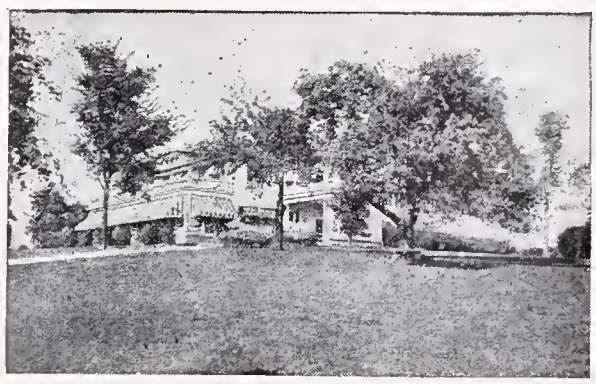
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Wright, L. T., et al.: Antibiotics and Chemotherapy 1:165 (June) 1951.

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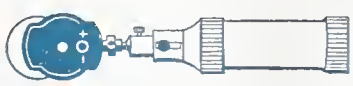
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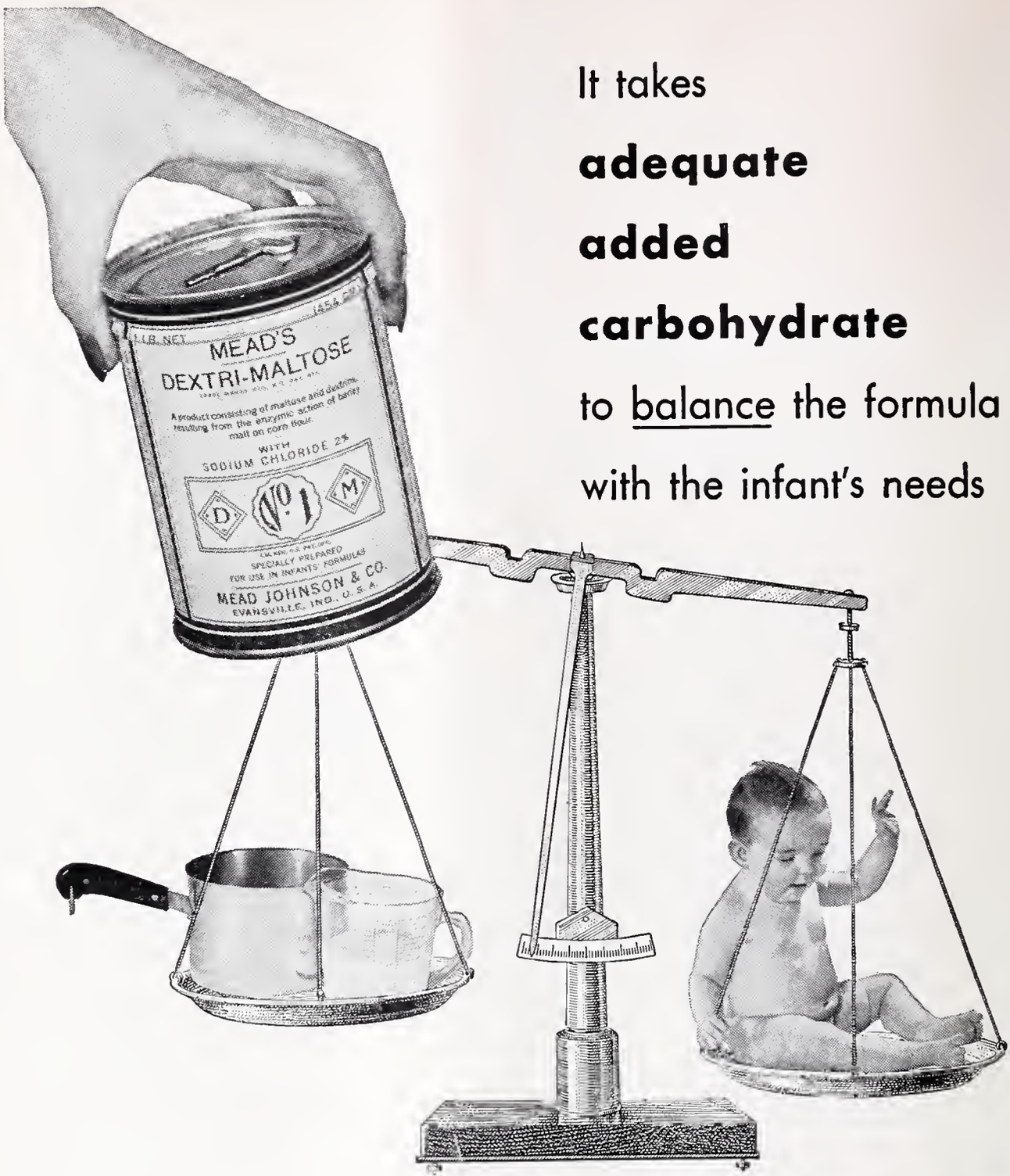
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1 Adams, C. H., and Cecil, R. L.: Ann. Int. Med. *33*:163, 1950.
2 Bayles, T. B.: Medical Forum, Mod. Med. (no. 24) *18*:86, 1950.
3 Gilbert, J. T., Jr., and Moore, F. H.: J. Kentucky State M. A. *48*:308, 1950.

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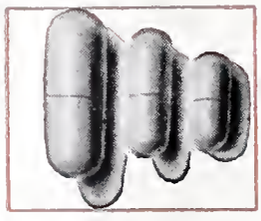
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County	District	President	Address	Secretary	Address
Andrew	1	V. R. Wilson	Rosendale	M. L. Holliday	Fillmore
Audrain	5	Thomas L. Dwyer	Mexico	Harry F. O'Brien	Mexico
Barton-Dade	8	Alvin R. Cain	Lamar	Max Heilbrunn	Lockwood
Bates	6	A. L. Hansen	Butler	L. D. LaHue	Butler
Benton	6	T. S. Reser	Cole Camp	James A. Logan	Warsaw
Boone	5	Joseph E. Allen	Columbia	James C. Cope	Columbia
Buchanan	1	Joseph L. Fisher	St. Joseph	Allen I. Herman	St. Joseph
Butler	10	A. D. Markel	Poplar Bluff	C. A. Post	Poplar Bluff
Caldwell-Livingston	1	Charles M. Grace	Chillicothe	Nathan W. Groce	Chillicothe
Callaway	5	R. B. Price	Fulton	R. N. Crews	Fulton
Camden	5	E. G. Claiborne	Camdenton	G. T. Myers	Macks Creek
Cape Girardeau	10	J. H. Trolinger	Jackson	John T. Crowe	Cape Girardeau
Carroll	1	John H. Platz	Carrollton	Eugene L. Bales	Carrollton
Carter-Shannon	9	Harry Rollins	Winona		
Cass	6	H. B. Neis	Harrisonville	David S. Long	Harrisonville
Chariton-Macon-Monroe-Randolph	2	Robert H. Young	Moberly	Henry K. Baker	Moberly
Clay	1	E. R. Knox	North Kansas City	S. R. McCracken	Excelsior Springs
Clinton	1	W. B. Spalding	Plattsburg	R. E. Wilbur	Cameron
Cole	5	H. B. Stauffer	Jefferson City	Robert H. Tanner	Jefferson City
Cooper	5	T. C. Beckett	Boonville	J. C. Tincher	Boonville
Dallas-Hickory-Polk	8	Evelyn Griffin	Buffalo	George Robinson	Humansville
De Kalb	1			W. S. Gale	Osborn
Dunklin	10	C. R. Peck	Kennett	E. L. Spence	Kennett
Franklin	4	B. G. Strehlman	Union	F. G. Mays	Washington
Greene	8	Kenneth C. Coffelt	Springfield	Charles E. Lockhart	Springfield
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Harrison	1	Merriam Gearhart	Bethany	W. A. Broyles	Bethany
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Holt	1	F. E. Hogan	Mound City	D. C. Perry	Mound City
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Jasper	8	W. T. McNew	Carthage	John W. Koehler	Joplin
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Lafayette	6	H. S. Brady	Concordia	Jordon Kelling	Waverly
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Lincoln	4	H. S. Harris	Troy	J. C. Creech	Troy
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Morgan	5	A. J. Gunn	Versailles	J. L. Washburn	Versailles
New Madrid	10	H. W. Carter	Portageville	O. B. Chandler	New Madrid
Newton	8	L. E. Rolens	Granby	L. T. Taylor	Neosho
Nodaway-Atchison-Gentry-Worth	1	G. R. Wempe	Tarkio	Charles D. Humbred	Barnard
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Ozarks Medical Society (Barry-Lawrence-Stone-Christian-Taney)	8	A. J. Graves	Mt. Vernon	R. R. Donley	Monett
Pemiscot	10	C. F. Cain	Caruthersville	C. C. Castles	Caruthersville
Perry	10	Theodore Fischer	Altenburg	J. F. Lutkewitte	St. Marys
Pettis	6	David R. Edwards	Sedalia	Carl D. Siegel	Sedalia
Phelps-Crawford-Dent-Pulaski	9	E. A. Stricker	St. James	M. K. Underwood	Rolla
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Ray	6	L. D. Greene	Richmond	M. L. Masterson	Richmond
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St. Louis City	3	L. R. Sante	St. Louis	J. E. VonKaenel	St. Louis
St. Louis	4	W. H. Bailey	Overland	M. A. Diehr	St. Louis
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Shelby	2	D. L. Harlan	Clarence		
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Stoddard	10	H. A. Harris	Bloomfield	W. C. Dieckman	Dexter
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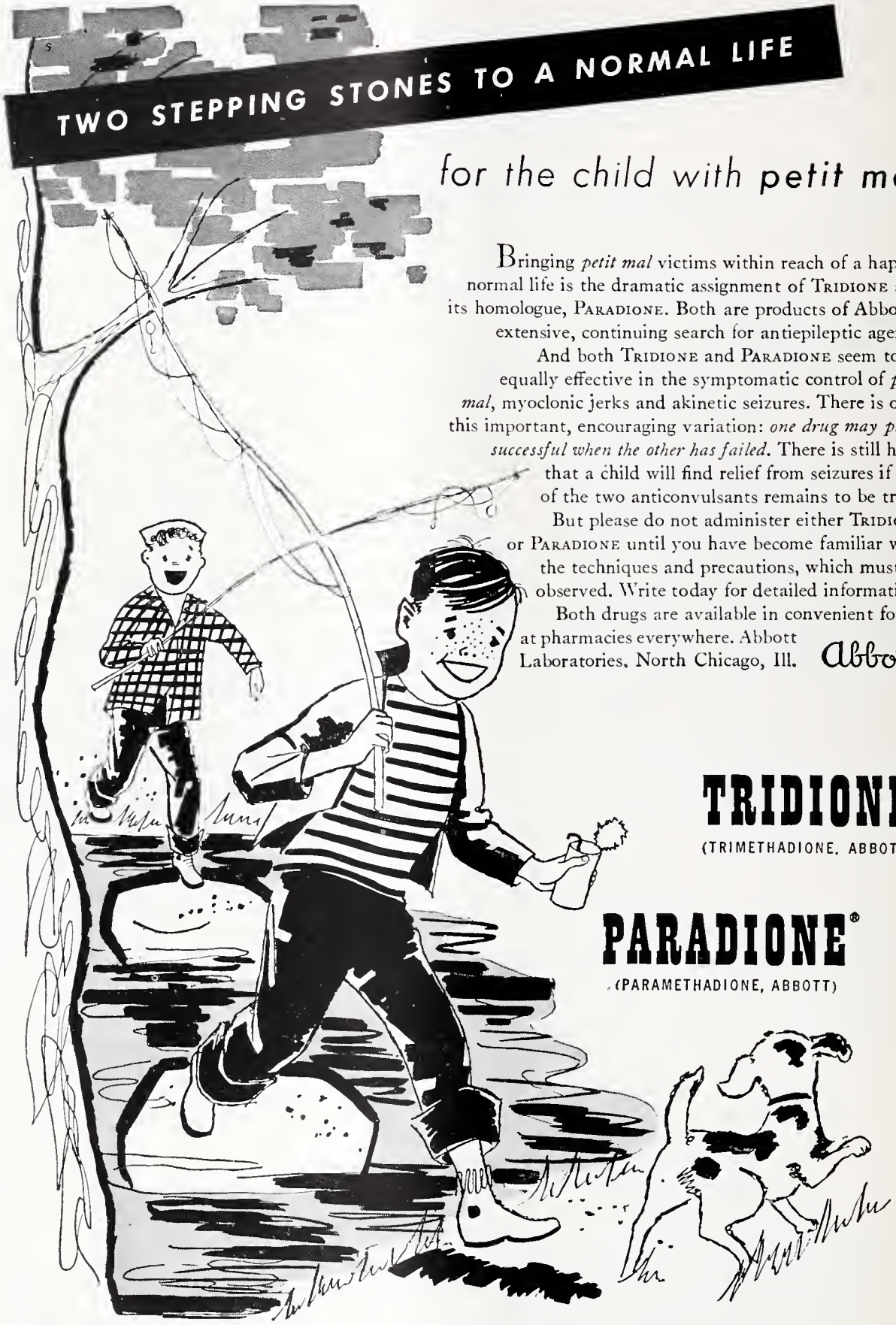
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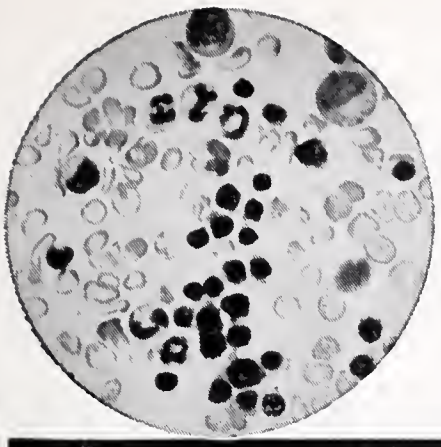
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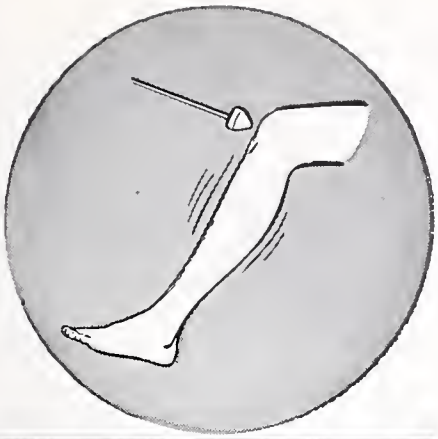
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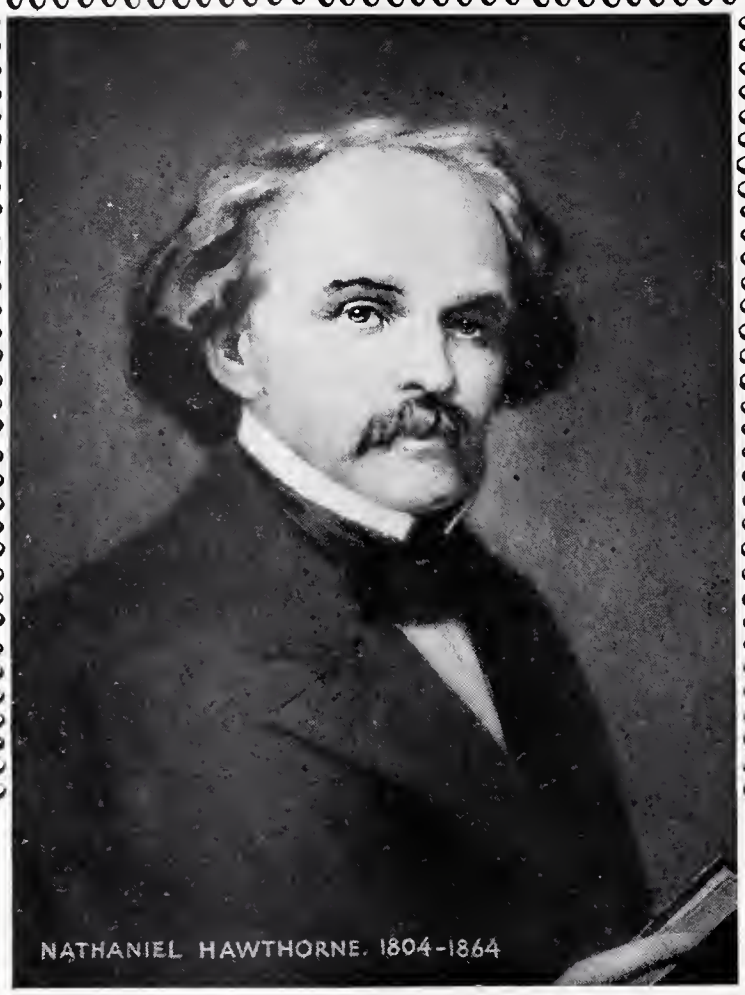
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Volume 48 **October, 1951** **Number 10**

PRESIDENT'S PAGE

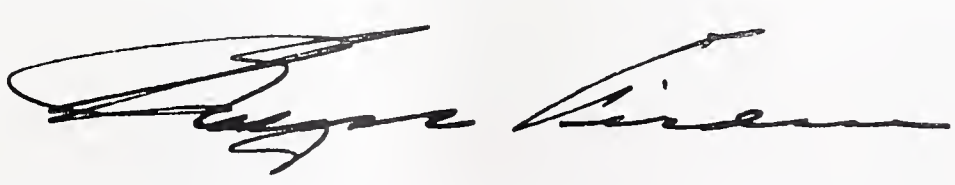
This issue of THE JOURNAL presents in one package most of the pertinent facts physicians and their communities need to know to prepare for an enemy attack and possible atomic bombing. The work done by the Committee on Emergency Medical Service of the Association, headed by Dr. Carroll P. Hungate, Kansas City, and assisted by Drs. J. E. Schiffmacher and B. Albert Lieberman, Kansas City; R. A. Ritter, Cape Girardeau; Joseph Conrad, Chillicothe; A. P. Rowlette, Moberly; M. Pinson Neal, Columbia; L. David Enloe and Buford G. Hamilton, Jefferson City; Curtis H. Lohr, Clayton; Howard B. Goodrich, Hannibal; A. S. Bristow, Princeton; G. E. Thoma and Norman P. Knowlton, St. Louis; William J. Shaw, Fayette; W. S. Sewell, Springfield; S. A. Grantham, Joplin; H. E. Petersen, St. Joseph, and Fred J. Biggs, Poplar Bluff, has been outstanding. They have formulated a plan which has been submitted to the state and accepted as a pattern for Civil Defense. This Committee has worked under considerable handicap without regard to personal sacrifices of time or energy and they have usually paid their own expenses.



We hope we may never have use for the facts in this issue but the situation is so uncertain that no one knows what to expect. All of our old ideas must be changed with the realization that America is vulnerable to attack. We, at least, as physicians, have realized the possibilities and have chosen to be forearmed and forewarned.

The present State Law is a handicap to the development of an adequate Civil Defense. An effort is being made to point out the ineffectiveness of this law with the hope that the Legislature will change it. It is no time for politics—we must be alert, we must realize what might happen and be prepared to defend and help ourselves and neighbors, if possible.

It is imperative that we have at least a skeleton peace time system of Civil Defense throughout the state. This organization should be one that can be expanded easily and quickly for use not only in case of an atomic attack, but to assist existing agencies in peace time disasters such as fire, explosions, floods and similar catastrophes. For purposes of intelligent planning and training, we should expect no less of our Civil Defense organization.



Committee on Emergency Medical Service (Civil Defense) of the Missouri State Medical Association

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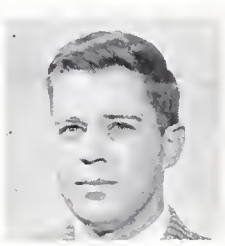


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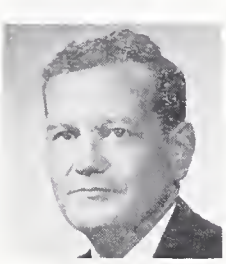


N. P. KNOWLTON, JR., M.D.
St. Louis



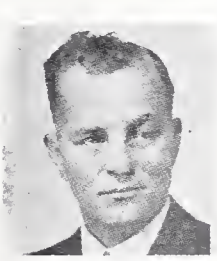


B. G. HAMILTON, M.D.
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Civil Defense

WHY CIVIL DEFENSE?

CARROLL P. HUNGATE, M.D.
KANSAS CITY

THE CREDULITY of the American people is being tested at the present time. It is extremely difficult for us to realize, not having fought a war on our own soil for a hundred years, that today we are in range of Russian bombers and Russian submarines. Saboteurs from within our country may be ready to strike in case of war.



C. P. HUNGATE

The face of the future is covered by an impenetrable mask and only when time has passed will we know what we foresaw or could foresee. Few of us realize that on July 16, 1945, a few scientists, on the desert sands of New Mexico, watched a "super mundane light" and an "apocalyptic mushroom topped cloud of nuclear fire" usher in the Atomic Age. Those young people under 25 years of age who live to see the Dawn of the 21st Century will see life as different from that of today as prehistoric man's life was from the civilization of 1950. While this may seem an incredible statement, you can imagine what our great grandfathers would have said in their day had such innovations been predicted as modern television, radar and jet aircraft. There is little doubt but that the splitting of the atom has resulted in a change throughout the world which affects all individuals in every land. At home, we are concerned with increased taxation to build up our defenses, both civil and military, in order to defend ourselves against the holocaust of atomic warfare. The Great Debate, brought about through fear, effects the thinking of our elected representatives, our foreign ministers and all who develop the political and military defenses of our country. The use of radioactive isotopes, the by-product of nuclear fission, and the by-product of the atomic bomb development, is reflected in industry, in research, in medicine and in agriculture. Our way of life is slowly being altered by the effects of atomic fission.

The American people should know something of the development of the Atomic Energy Program. As a taxpayer each is contributing his share to the billions of dollars needed to develop this program.

The first nuclear reactor or atomic pile was built at the Argonne Laboratory in Chicago. Scattered throughout the universities of the Middle West are research laboratories contributing their part to the knowledge of nuclear reactions. Best known of the atomic energy plants is the one at Oak Ridge, Tennessee, and scattered throughout the universities of the Southeastern part of the United States are many research laboratories. In the Northeastern part of the United States, there is the Brookhaven Laboratory on Long Island; in the State of Washington, is the Hanford Plant where plutonium is made; at Los Alamos in New Mexico, the atomic bomb is assembled.

The Arco Laboratory, which is the newest of the laboratories, is in the State of Idaho, near the Craters of the Moon National Monument. This laboratory was built for research on shielding materials. In the building of atomic power plants, a shielding material must be developed which will withstand the tremendous heat generated by the plant and one that will contain the radioactive rays and particles which are given off by the material used as a source of energy in the plant. We can be assured that a shielding material will be developed at the Arco Laboratory.

When man has found such a shielding material, a working nuclear power plant will be a reality and for all practical purposes man will have at last created a source of perpetual energy and perpetual motion will be the result. The present submarine, powered by storage batteries which take up a tremendous amount of space, in the central structure of the submarine, will be a thing of the past. Powered by a nuclear plant, a submarine would have all the space, previously taken up by storage batteries, released for the use of personnel and supplies. Such a submarine could go around the world, submerged, as long as one desired or until it was necessary to return to home port for a rotation of personnel and replenishment of supplies. An aircraft powered by a nuclear plant would release the space now used for tons of gasoline for personnel and the supplies. Such an aircraft could fly as far and as long as one desired and would need to land only to rotate personnel and replenish supplies.

The outbreak of the Korean War jolted the United States into hasty military preparations. A simultaneous realization of the need for civil defense of our great cities occurred and civil officials began scrambling around trying to do something about it. Previously, civil defense had been considered as nothing more than a blackboard exercise. We now appreciate the wisdom and foresight of the late James Forrestal, first Secretary of Defense, for it was he who saw the need for civil defense in the United States in the Atomic Age. He created in the Department of Defense the Office of Civil Defense and appointed, in the spring of 1948, the Hopley Committee. The committee made a study of

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Opinions stated are those of the author and not the official opinion of the Navy Department.

civil defense needs and the Hopley Report was completed in December 1948. Copies of the report were sent out to the governors of the various states and only gathered dust in the basements. In Ohio, for example, 500 unused copies were found. Such was the attitude toward civil defense prior to the outbreak of hostilities in Korea.

Many may wonder why physicians have such a great interest in civil defense. Physicians have a priority interest in the protection of the people of this country against disease and injury. Following World War II, medical officers of the Armed Forces and private physicians made surveys of the effects of conventional bombing in England and on the Continent. They also made surveys of the effects of the atomic bomb explosions in Hiroshima and Nagasaki, Japan. They came to the conclusion that should a similar catastrophe occur in the United States hundreds of thousands of Americans would be crying out for their doctor and there would be no doctors. Seventy-five per cent of the doctors and nurses in Hiroshima were annihilated at the time of the explosion in Japan. The military forces, and particularly the Navy, began courses of instruction in the medical aspects of the atomic bomb and advised the Reserve doctors attending these courses to return home and stimulate an interest in civil defense. Physicians throughout the width and length of the United States began a campaign for civil defense in order to arouse the civil population and public officials to the need and urgency of a Civil Defense Program.

Today, we know a great deal concerning the effects of the atomic bomb. We know that it is most efficient when detonated at a height of 2,500 feet over a large metropolitan area.

The harbors of our coastline are considered too shallow to produce enough fallout from the upsurge of water in an underwater detonation, while a detonation at ground level produces in itself a comparatively small amount of damage.

The effects of the atom bomb fall into three categories: mechanical, thermal and nuclear. The mechanical effects are in the form of a blast, the thermal effects in the form of a heat wave, and the nuclear effects in the form of radiation.

When an atom bomb explodes, it's as if a small bit of the sun had exploded close to the surface of the earth. Small particles of uranium or similar substance explode causing a tremendous flash of light a hundred times more brilliant than the sun. The center of the ball of fire has a temperature in the millions of degrees.

Thermal energy is given off in the form of a heat wave. As it leaves the ball of fire, the heat wave has a temperature of 4,000 degrees Centigrade. The flash of heat at the time of the burst will produce burns out to two miles from ground zero. Bizarre effects of the heat wave may occur at a greater distance, depending upon the atmospheric conditions at the time of the explosion.

The heat wave produces what is known as flash burns. The flash consists of three types of light: ultra-violet, infra-red and brilliant light. With few exceptions, the flash burns are produced by the infra-red rays. The light is transmitted in the form of radiated heat. It travels in a straight line. Because of its high intensity, but short duration (it lasts but a few seconds), protection is easily obtained which will prevent burns. At ground zero, the area directly beneath the bomb bursts and extending out for a radius of one-half mile, great damage will occur due to heat. Personnel will be protected from the flash of heat in this area only by hiding behind a strong shielding material. Personnel in the area one-half mile to two miles will have varying degrees of burns, depending upon the distance from the source and the shielding material. In this area, most any covering of the skin will prevent or reduce the seriousness of the burn. White clothing reflects the radiated heat; black clothing absorbs it.

The thermal ray, having such high heat intensity, will kindle telephone poles and shingles on the roofs of houses, and fuse, directly under the bomb, the surface of concrete, metal storage tanks and other material of a similar nature.

Following the heat wave comes the mechanical energy in the form of a blast with a positive and negative phase. This blast wave leaves the ball of fire with the speed of sound, 800 miles per hour and then gradually falls off at the end of three miles to fifty miles per hour. The pressure, in itself, is not sufficient to produce physical damage to human beings. The damage to humans is indirect and the result of flying debris. The blast will blow out flames kindled by the heat wave, but due to the rupturing of gas mains, the overturning of cook stoves and short circuits, secondary fires will occur in the center of the devastated area. Depending upon atmospheric conditions, these secondary fires will consume the oxygen and produce a vacuum. A secondary blast or suck-in will result which will sweep all residual pulverized radioactive material before it into the pillar of fire and smoke. This material will rise to an altitude of from 40,000 to 60,000 feet and the prevailing winds disseminate the material in the stratosphere. The blast produces bizarre effects. Buildings are crushed as if by the weight of a giant hand. Whole walls of buildings are dislocated in mass, roofs are collapsed and the interior of buildings are gutted by fires. Water pipes are broken, factories destroyed, streets filled with debris. This is different from conventional bombing. In conventional bombing, the destruction occurs piece-meal and is spread out in time and space. Between attacks, the populous has an opportunity to dig out, thereby weathers the storm. In atomic bombing, the devastation occurs all at once and it occurs all over. In a fraction of a second, a modern city is prostrated. The central government no longer functions. There is no fire department. The water

does not run. Factories remain still. Hospitals are no longer well equipped or well staffed. There is no electricity, no communications. Without previous planning, such a stricken city is helpless.

Nuclear energy is given off in the form of radioactive rays or particles, namely alpha, beta, gamma and neutrons. The alpha and beta particles have a low penetrating quality, but are dangerous if taken internally. Gamma rays are much like x-rays and extend out as far as one mile from ground zero. Neutrons have a powerful penetrating quality but extend a short distance from the ball of fire. It is the gamma ray which produces the damage to human beings. In the area close to the bomb, strong shielding materials of concrete are necessary. At ground zero, complete protection is given only in underground shelters with walls of concrete four feet thick. The effects of gamma rays depend upon three factors: distance from the source, shielding material and individual sensitivity to radioactive rays.

The roentgen is a measure of radioactivity. It is a term which in the future will be as well known as the words inch, foot or pint. There is a difference in the effects of localized radiation and total body radiation. Man can withstand several thousands roentgens of exposure to a localized cancerous lesion. Total body radiation is an entirely different matter. Six hundred roentgens of total body radiation will produce death in 100 per cent exposed; 400 roentgens of total body radiation will produce deaths in 50 per cent exposed and serious illness in 50 per cent exposed; 200 roentgens total body radiation will produce death in many, and some illness in the remainder. With 100 roentgens total body radiation, some will escape illness, some will be slightly ill and some will be seriously ill. With 50 roentgens total body radiation, little damage will result with the exception of, perhaps, some anemia. In atomic energy plants and in laboratories, only an absorption of 0.3 roentgens per week is permitted.

Fifty per cent of the effects of atomic warfare are psychologic. Photographs of personnel at Hiroshima, taken two hours after the explosion, revealed many people still sitting on the ground. They were unprepared for such a catastrophe and were so shocked mentally that they could not move.

"Mainly because the civilian population of the largest cities of America will not only be the shock troops of any next world war, but also will constitute the mobilized manpower for purposes of counterattack and mop-up, one of the major problems now confronting the youth of the nation is the problem of survival; and because the means of survival, in an age of technologic warfare, do not come as inborn, intuitive or instinctive knowledge, the provision of a correlated form of survival training has, quite inadvertently, become one of the pressing duties of national government. Recognition of that fact is, of course, back of any inquiry into the necessity for a sound plan of civil defense. Specifically, civil defense training is now survival training."

If we could monitor the Russian General Staff in their classes at the Soviet Air Academy near Monino outside of Moscow and at the Command and Staff College in Moscow, we would find that 800 students of military tactics and strategy were studying the translations of two books, one, "Invasion from Mars" by Professor Hadley Cantril of Princeton University, and the other, "Men Under Stress" written by Colonel Grinker and Major Spiegel concerning the psychologic effect of warfare on our young men in World War II.

The Russian high command is not studying these translations as a mere hobby or as a pastime. The Kremlin planners realize that the weakest point of the strongest nation in the world is its susceptibility to panic. In 1938, when the Orson Wells program went on the air, it is a matter of record that an entire community in a New England village wrapped wet towels around their faces, rushed down to the City Hall and demanded gas masks. A father in Pensacola, Florida, killed his two children to prevent their being captured by the men from Mars, and a newspaper publisher in Memphis, Tennessee, published in his newspaper the destruction of Chicago and St. Louis.

The educational program in civil defense is of primary importance. Its purpose is to indoctrinate the population in the mechanisms of defense against atomic warfare and to educate the people as to the effects of an atom bomb explosion. An enlightened civilian population and a trained organization of civil defense workers will go far in preventing the panic which occurred at Hiroshima. There, thousands of people were burned to death, who might have been saved, through the fear and panic of the general population.

A thermonuclear weapon of unheard of destructiveness has been mentioned as a possibility for eighteen months. Lawrence and Wendt have written books concerning this weapon, "The Hydrogen Bomb." We can be fairly certain at this time that the experimental phase in the development of the hydrogen bomb has progressed satisfactorily, as shown at Operation Greenhouse, and that such a bomb can be made a reality. The giant stride between the research laboratory and the finished product has been shortened. The Gordian nuclear knots are being untangled. The hydrogen bomb can be made so that it is a thousand times more devastating than the atom bomb. Although much information concerning this type of thermonuclear weapon is clothed in secrecy, we can assume that it takes an atom bomb to detonate the hydrogen bomb. Using new types of atomic bombs, temperatures from fifty million to two hundred million degrees are developed at

the time of detonation. This temperature is sufficient to ignite liquid hydrogen. To explode, hydrogen must be converted into a solid and this is done by compressing the gas, hydrogen, under about one atmosphere at 423 degrees below zero Fahrenheit. Tritium, an isotope of ordinary hydrogen, is added to deuterium, another isotope of hydrogen, and acts as a kindling agent. It will cause the heat generated by the explosion of the atom bomb to last long enough to cause an explosion of the liquid hydrogen. This can be explained more simply by comparing the explosion of a hydrogen bomb to the igniting of a fire in the forest in the winter time. If you go into the woods in the winter and wish to build a fire, most of the wood is covered with ice and snow. If you light a match to the wood, it does not burn, even though the temperature is high enough. The heat simply does not last long enough. But if you throw gasoline on the ice-covered wood and then ignite the gasoline with a match, the gasoline acts as a kindling agent and will burn long enough to ignite the green wood. The explosion of an atomic bomb in the hydrogen bomb produces the proper temperature and the tritium acts as the kindling agent. The hydrogen bomb, all to the contrary notwithstanding, could be rigged so that much of the civilization of the world, as we know it, could be destroyed. We cannot underestimate our Russian opponents in the hydrogen bomb race as the greatest living authority on liquid hydrogen is a Russian scientist.

For five years we were fat, dumb and happy in this great country of ours, so busy building up our material wealth that we completely ignored Russia's predatory advance throughout the world. In five years, Russia increased her population from two hundred million to eight hundred million. She has stated that capitalism and communism cannot live in this world together. Like Hitler, Stalin has made no effort to disguise his intentions of conquering the world.

This country was founded by freedom seeking people who sought a land where they could practice freedom of religion, freedom of speech, freedom of assembly and had the right to hold property. There was no standard of living when the Pilgrim Fathers landed on the shores of this continent. The fundamental principles of freedom were all they required and that is the great heritage one generation passes on to another. Every American citizen has as his duty the support of any and all methods by which we can maintain and defend our liberties in order that our children and our children's children will inherit the same birthright that our forefathers fought and died to preserve for us. We must give of our time and money to support civil defense programs throughout this nation. We can lose our money and we have lost only money, but if we lose our freedom, we have lost all. In this Atomic Age, the defense of democracy is, more than ever, civil defense.

From the beginning of time, every invention of mankind has been capable of two uses, good and evil. The evil will pass, as all evil passes, and mankind will derive the benefits of the atomic age. In research, medicine, industry and agriculture, much good has already resulted from our knowledge of nuclear energy. One is reminded of the prophecy of the chemist, Pierre Berthelor, at a dinner party in 1869, when he said that "Man would know of what the atom is constituted and would be able, at will, to moderate, extinguish, and light up the sun as if it were a gas lamp," to which the Goncourt brothers added the postscript in their Journal: "To all of this we raise no objection. But we have the feeling that when this time comes to science, God with His white beard will come down to Earth swinging a bunch of keys, and will say to humanity the way they say at 5:00 o'clock at the salon: 'Closing time, Gentleman!'"

"Yet, the sound of swinging keys need not mean the twilight of man's day on this planet. It could be the dawn of a new Earth . . . and a new Heaven."

934 Argyle Bldg.

Capt. (MC) USNR, Senior Medical Officer, U. S. Naval Air Station, Olathe, Kansas.

CIVIL DEFENSE NEEDS *EVERY* PHYSICIAN

EDWARD F. STEGEN
WASHINGTON, D. C.

A LONG TIME ago Francis Bacon said, "In the theatre of human life, it is only for God and the angels to be spectators." In the atomic age these words achieve a literal and dramatic meaning far beyond the intentions of the author. The times in which we live impose on every citizen in this Nation and the free world a new set of responsibilities. These rules by which we live are the fundamentals of civil defense.



EDW. F. STEGEN

The harsh realities are: Russia has atomic bombs, biological and chemical weapons. Russia has a fleet of long-range heavy bombers which can assault the production centers and major cities of America in one smash attack. There is little that we can do to stop them. It is estimated that our kill potential against systematic air attack would be less than 30 per cent. Thus, seven or eight out of every ten bombers launched from Russian homeland bases can be expected to deliver their cargo of death upon us.

A smash attack can come with only brief warning or probably no warning at all. It may be tomorrow, next week, next month, next year

Formerly Regional Director, Midwest Region, Federal Civil Defense Administration.

or ten years hence. It is not possible to set a date when our home-front preparations must be sufficiently strong to withstand such an attack, but we cannot gamble our lives, our productive capacity, our will-to-win, and our freedom. We must get ready—fast!

In spite of a natural unwillingness to accept and fully understand the meaning of these facts, most of our citizens have a growing awareness that the vast destruction of area weapons—atomic, biological and chemical—can be inflicted upon our homeland in substantial force and at the time and places chosen by the attacker.

Not so well known is the fact that much can be done by a soundly planned civil defense program that will save hundreds of thousands of lives, retain our capacity to retaliate in force and preserve our will-to-win. Another most important consideration which has not yet gained full acceptance by our people is that a high level of civil defense preparedness will be the strongest deterent against such an enemy attack ever occurring.

When the first atomic blast occurred at Hiroshima, hysterical people thought we had reached the end of the world. Fortunately, even atomic weapons have limits of destructiveness. Adequate civil defense can do much to reduce the horrible effects upon life and property when atomic blasts occur. This Nation can survive an atomic attack, or even an attack in force with all of the new weapons in the arsenal of the enemy, if we have the will to do what must be done before it is too late. We must step up the pace of civil defense preparedness and education.

For the medical profession, full and active participation in civil defense is more than a call to arms for an emergency period. Every physician in America must participate in the step by step development of civil defense plans in his own community. To serve best he should begin immediately to acquire factual information from all available sources on the medical and health aspects of atomic, biological and chemical weapons.

This issue of The Journal is intended to provide a part of that vast store of information. But every physician-citizen must personally assume the responsibility of fully qualifying himself to serve his community and the Nation in every phase of the developing civil defense program. It is not enough for the physician, no matter how busy he is dealing with the day-by-day health problems of his patients, to assume the traditional attitude of willingness to be called in on the case. He must add self training for civil defense and participate in the planning, organization and coordination of the program.

Perhaps at this point the reader's mind has already centered upon the question, "Specifically, what can I do about it?" Before answering that question, let me review very briefly the pattern of civil defense.

Civil defense starts with the individual and the family. No amount of organization, no vast expenditure of funds, can build a bomb proof, panic proof umbrella over each individual and each family that will completely protect them from the terror weapons of modern warfare.

Every individual citizen must know what he is up against and what to do about it. The facts of survival must be learned well at the hearthstone, in neighborhoods, in factories, in schools and in every community, business, social and civic group. Our country needs 150,000,000 civil defense educated civilians and an adequate civil defense organization in every neighborhood, community, city and state.

A local civil defense program with the full scientific and intellectual strength of the medical profession behind it will speed this vast and difficult task of training our citizens. But now to the point.

What are the things which the physician can do right now? First, as a citizen, learn how to protect yourself and your family. In this time of imminent peril personal survival should be considered an accomplishment. The intelligent aid given to a group of other persons, however small that group may be, is a service of mercy which will count its rewards in human lives.

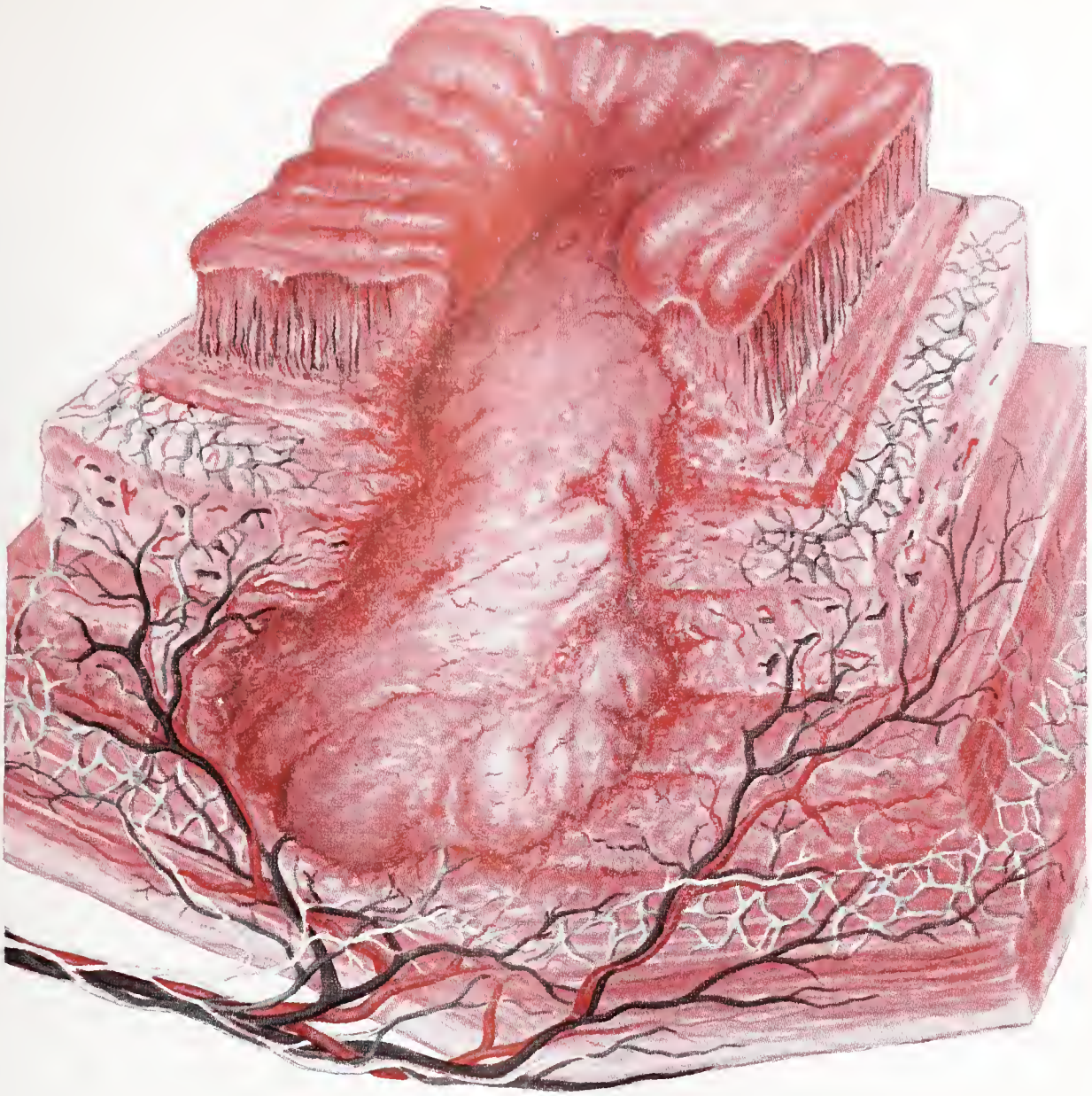
Second, shoulder your responsibilities as a leader in your community. Join your local civil defense corps. Participate in its planning and development. Personally educate your family, your neighbors, your associates and members of the allied professions on the facts of survival. Set an example for others who do not understand the dangers we face.

Third, offer your professional services and your "know how" to your local and state civil defense organizations. Do this as an individual and through the organizational channels provided by your professional societies. Your ability and your willingness to serve are priceless assets to civil defense.

Fourth, take an active part in the civil defense work of the Missouri State Medical Association. The group technical and professional knowledge which your societies can make available to community and state civil defense directors will greatly strengthen their efforts and will result in the saving of many lives.

Finally, use bold imagination, leavened with sound judgment, in your personal and professional approach to civil defense. Civil defense needs from you: An intensive, intelligent effort to inform your citizens, your participation in the greatest mass selling campaign ever undertaken in history and your continuing efforts to improve and extend the efficiency and effectivenes of civil defense.

In most organizations, the thankless, time consuming tasks are left to the faithful few. In our time, it is only for God and the angels to be spectators in the theater of human life.



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SEARLE RESEARCH IN THE SERVICE OF MEDICINE



The Importance of

PREVENTING BORDERLINE NUTRITIONAL STATES IN CHILDREN

IN recent years increasing interest has been focused on the relationship between nutrition and the physical, mental and emotional development of children. It is now well recognized that listlessness and apathy in the child frequently may be nothing other than manifestations of a borderline nutritional state resulting from faulty food selection and inadequate consumption. Moreover, such sequelae of faulty nutrition often respond dramatically to improved food habits.*

For preventing borderline nutritional states in children due to food whims, poor choice of foods, or lack of interest in eating, Ovaltine in milk enjoys long-established usefulness. Its rich content of biologically complete protein, vitamins and minerals can supplement even grossly deficient diets to optimal nutrition. The delicious flavor of Ovaltine invites its acceptance and lends interest to eating when the appetite lags. Children particularly like Chocolate Flavored Ovaltine.

Three servings of Ovaltine in milk furnish the supplementary amounts of nutrients shown in the appended table.

*Baumgartner, L.: Wider Horizons for Children; The Mid-century White House Conference and Children's Nutrition, J. Am. Dietet, A. 27:281 (Apr.) 1951.

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CALCIUM	1.12 Gm.	NIACIN	6.8 mg.
PHOSPHORUS	0.94 Gm.	VITAMIN C	30.0 mg.
IRON	12 mg.	VITAMIN D	417 I.U.
COPPER	0.5 mg.	CALORIES	676

*Based on average reported values for milk.

Two kinds, Plain and Chocolate Flavored. Serving for serving, they are virtuolly identical in nutritional content.

STATE LEVEL CIVIL DEFENSE, HEALTH AND MEDICAL SERVICES AND SPECIAL WEAPONS DEFENSE

BUFORD G. HAMILTON, M.D.
JEFFERSON CITY
HERBERT S. MILLER, M.D.
JEFFERSON CITY

FUNCTIONS OF THE Civil Defense Health and Medical Services and Special Weapons Defense at the state level are of three kinds: administrative, planning and organizational and operational. The operational functions are of two kinds: predisaster operations and operations during and immediately after the disaster.



B. G. HAMILTON

Discharge of the administrative function involves participation in the planning, organization and operation activities of the Missouri State Office of Civil Defense. The following are examples of activities which are preformed in this category: (a) integration of the health and medical services and special weapons defense aspects into the over-all state Civil Defense Plan; (b) participation in establishment of policies and regulations of the Missouri State Office of Civil Defense; (c) acting as liaison for the Missouri State Office of Civil Defense in health and medical services and special weapons defense matters between the federal government, other states and political subdivisions of Missouri.



H. S. MILLER

Examples of the activities which are classified as planning and organizational on the State level are: The definition of responsibilities, recruitment of volunteers and the assignment of responsibilities; the coordination of activities of all groups concerned with health and medical services and special weapons defense on a state-wide basis. Expressed in general terms, this function entails the preparation of a comprehensive and detailed state-wide plan for Health and Medical Services and Special Weapons Defense and development of an organization with which such a plan may be implemented.

At the present time, the problems which appear most difficult concern the function of pre-attack operations. The magnitude and variety of these activities can be appreciated by noting that the goal is the greatest possible development, in the shortest possible time, of a corps of volunteer workers adequately indoctrinated, fully equipped and trained to perform all the jobs needed to provide the necessary Civil Defense Health and Medical Services and Special Weapons Defense in the State Civil Defense Plan.

Some examples of activities required in the performance of these predisaster operations are: constant observation, testing and evaluation of the local health and medical services and special weapons defense as they develop throughout the state; preparation of estimates of personnel, supply and equipment to implement the state-wide plan; correlation of original procurement, resupplying and disposition of health and medical services and special weapons defense supplies in terms of the needs of the state-wide plan; formulation and implementation of training programs in health and medical services and special weapons defense for all civil defense workers. This function also entails, in conjunction with local authorities: determination of the number, character and composition of health and medical services and special weapons defense components of mobile support and evacuation units to be developed by the local area; assisting in local planning so that coordination with the state plan can be attained. In conjunction with local civil defense authorities and with other elements of the Missouri State Office of Civil Defense, the transportation and communication services organic to the health and medical services and special weapons defense must be developed.

Operational functions of state health and medical services and special weapons defense during the disaster and post disaster period consist in working as one of the units of the Missouri State Office of Civil Defense in discharging the duties of that office relative to mobile support and evacuation. This attack period operation can be adequate only if the pre-attack operations have been carried to a high degree of a completion.

Given a Missouri State Office of Civil Defense operating as an integrated unit, given a basically adequate state-wide health and medical services and special weapons defense plan, given individual citizens willing to implement that plan either by voluntary enrollment or by willing acceptance of assignment in local civil defense units and by participation in training and testing exercises, given professional, semiprofessional and lay groups willing to give of their knowledge and to assume and discharge responsibilities, and given individuals, groups and government willing to provide money (per se' or in kind) for absolutely necessary expenses, there is every reason to expect that the predisaster time available will be used to maximum advantage.

Evidence of good use of the predisaster time available will be apparent when, after the disaster, one can claim that the following were true:

1. A maximum of lives were saved.
2. Morbidity was minimized.

Director, Health and Medical Services, Missouri office of Civil Defense.
Liaison Officer, Health and Medical Services, Missouri Office of Civil Defense.

3. Maximum medical rehabilitation was rapidly attained.

Missouri Division of Health.

ROLE OF THE RED CROSS IN CIVIL DEFENSE

MR. MILTON TAINTER
KANSAS CITY

The development of a sound civil defense program deserves and will require the special attention of Red Cross chapter leaders everywhere. We, in the larger cities, are possibly more conscious of the possibility of attack but Red Cross leaders realize that regardless of where disaster strikes, it is our responsibility to give aid and comfort to the victims and to lend the full weight of our organization in mitigating the suffering.

The role of the American National Red Cross in civil defense has been defined in a joint statement by the Red Cross and the Civilian Mobilization Office of the National Security Resources Board. The statement, in part, follows:

"The protection and care of families and individuals subjected to enemy attack is a basic responsibility of all governmental groups. It is expected that volunteer agencies participating in civil defense, including Red Cross, will serve under the general direction of responsible government agencies. Because of limited funds and facilities and the magnitude of the problems that arise in war disasters, the American Red Cross cannot be expected to assume responsibility to the extent that it does in natural disasters.

"However, the experience and resources of the Red Cross in its disaster program and other community services programs can be utilized to advantage by the government in planning and operation of civil defense. Because of its existing organization and long experience in national disaster relief activites, Red Cross representation on state and local civil defense planning groups should be encouraged.

"The American National Red Cross has agreed to assist to the extent of its ability in the development and operation of a program of civil defense on national, state and local levels, in the following specified phases:

"(a) Training civil defense workers and the general public in first aid;

"(b) Training in home care of the sick and injured, and nurse's aide activities;

"(c) Provision of food, clothing and temporary shelter on a mass care basis during an immediate emergency period;

"(d) Participation in a wartime nationwide blood program; and

"(e) Making available its existing organized chapter volunteers and resources for participation in civil defense activities."

Executive Director, Kansas City Chapter, American Red Cross, Kansas City.

In the present framework of civil defense in our locality, Red Cross chapters are being looked to by civil defense to develop a program of mass care during the immediate emergency period. To this end practically the entire State of Missouri has been surveyed by local Red Cross chapters to list the available buildings that might be used for mass shelters and feeding stations.

Food, clothing and shelter would be the primary services through which Red Cross chapters can make their greatest contribution. Registration and welfare inquiries, and assisting with the identification of casualties are all important phases of disaster relief work in which local chapters and trained Red Cross disaster workers can assist civil defense authorities.

Of the five specific phases of Red Cross participation in a program of civil defense, four of these five are directly in connection with, or as an adjunct to, the program and services of local medical societies. Let's take the first one: (a) training civil defense workers and the general public in first aid—our First Aid program has long been recognized, endorsed and sponsored by the medical profession. What to do and what not to do to an injured person before the doctor arrives are the primary purposes of First Aid. The civil defense supplement to the American Red Cross textbook was prepared carefully by the American National Red Cross and the Federal Civil Defense Administration under the guidance of the medical fraternity. Even so, it is required that locally the medical society should recommend certain treatments for burns, shock and wounds before the course is taught by our trained lay instructors and that this training be adapted to the general program of the medical division of civil defense.

The second responsibility of Red Cross in civil defense, (b) training in home care of the sick and injured, and nurse's aide activities—again is an adjunct of and supplement to the over-all medical and nursing phases of civil defense. Red Cross has wisely dropped the terminology "Home Nursing" for the more appropriate title "Training in Home Care of the Sick and Injured" for it is a course designed to teach the simple skills of (1) making a patient in the home more comfortable, (2) instructing someone in the home how to follow the instructions of the attending physician, (3) how to recognize symptoms in the patient that should be reported to the attending physician. The course is taught in six two-hour lessons, therefore it cannot be considered that those receiving this training are in any way qualified as nurses or nurse's aides, but they have been given some basic knowledge of how they can help take care of the sick and injured in the home. Again, this training course was developed by the American National Red Cross in cooperation with the nursing profession and approved by the American Medical Association. Locally, members of the nursing profession and the medical society are members of the chapter

committee to supervise and direct the teaching of this course in their community. Our ultimate objective is that someone in each home be taught these simple skills.

The training in nurse's aide activities presents a bit more complicated program inasmuch as the Red Cross Volunteer Nurse's Aides have an eighty hour basic requirement. Forty hours of this prescribed course is in lecture sessions taught by members of the nursing and medical profession and hospital authorities, the remaining forty hours in a service program under close supervision in a hospital. Under these requirements it is obvious that the extent and expansion of this course is dependent upon the availability of the medical and nursing profession to teach and train these volunteers both in the classroom and the hospitals. In Kansas City we have an objective of training 5,000 nurse's aides for the medical division of civil defense. That is a sizeable order.

The third phase of Red Cross participation in civil defense (c) provision of food, clothing and temporary shelter on a mass care basis during an immediate emergency period, has been mentioned and, while it does not have direct relation with the medical division of civil defense, the medical profession as a whole are interested in the plans for these temporary shelters for it definitely presents public health problems and requires supervision from the medical and nursing group to prevent the spread of communicable diseases, sanitation and minor injury cases. More directly, our survey of available buildings will be of interest to the medical director of civil defense for many of these buildings will be designated as temporary hospital facilities. On a local level, the medical director and the person responsible for shelters should decide and agree upon which buildings will be used and for what purpose.

The fourth phase of Red Cross participation in the planning for civil defense (d) participation in a wartime nationwide blood program—probably the most significant service in our preparation for the defense of our country is the Red Cross Regional Blood Centers and the Defense Blood Centers being operated by Red Cross throughout the country. In Missouri, through the Regional Blood Program in St. Louis, the Regional Blood Program in Springfield and the Defense Blood Center in Kansas City, practically every county has the opportunity to participate in this worthwhile life saving program. Again, the medical society in each community plays an important part in the sponsorship of these blood facilities. At present the blood being collected through the St. Louis and Springfield Regional Centers and their cooperating chapters is being directed to the armed forces and civilian hospitals. In Kansas City and the cooperating chapters, all blood collected is being directed to the armed forces and Veteran Administration hospitals. A given quota of blood will be processed into irradiated plasma and stockpiled for civil defense purposes. The distribution of such will be the responsibility of civil defense authorities on a national and state level.

With the establishment of twenty new defense blood centers plus the expansion of the regional program in the thirty-five centers, we have a network of blood facilities in the United States that would immediately go into action in drawing blood and supplying it to any affected area. A great deal has been said on the subject of blood typing for civil defense. While the Red Cross blood program will not attempt a program of typing all individuals in the community, yet, as the program grows and more and more donors are recruited, the backlog of individuals in each community with their known blood type and Rh factor becomes permanent records.

The fifth phase of Red Cross participation (e) making available its existing organized chapter volunteers and resources for participation in civil defense activities—the greatest resource of Red Cross is its million of trained volunteers. These volunteers from all walks of life, a cross-section of America itself, have received some type of training to serve their fellow man and their community. Next to this great reservoir of trained volunteers in resources of the Red Cross, is the seventy odd years of experience as an organization in meeting emergencies and handling disaster relief work. If war comes and our cities are subjected to attack by new weapons of appalling destructiveness, the scope of the disaster would dwarf any we have known. Our national security, even our very survival will depend on how well we meet this challenge.

INDISCRIMINATE USE OF ASPIRIN MAY AFFECT BLOOD

Serious effects may result from the indiscriminate use of such salicylates as aspirin, according to a report in the Sept. 8 *Journal of the American Medical Association.*

The case of a 74 year old man who experienced eight years of continuous intestinal bleeding as the result of prolonged use of aspirin was reported by Drs. Walter Modell and Russel Patterson of the department of pharmacology and surgery, Cornell University Medical College, New York.

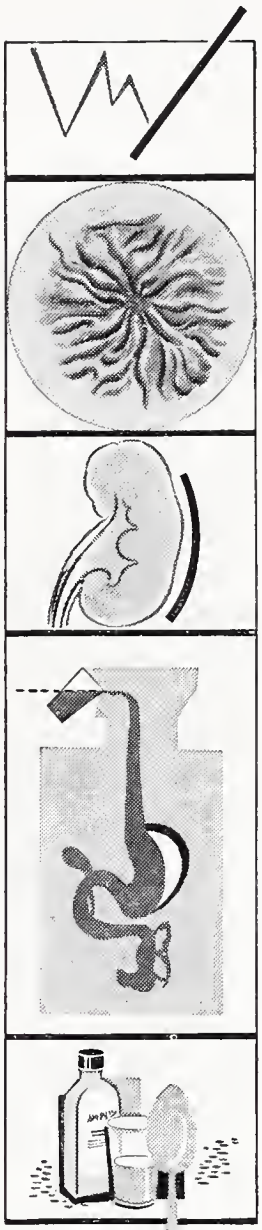
"Serious toxic reactions to the salicylates are rare in relation to the widespread use of this group of drugs," the report stated. "In the present case it was possible to establish a casual relationship between prolonged intestinal bleeding and the taking of acetylsalicylic acid."

The patient, according to the report, suffered from weakness, anemia and a decrease in the number of colorless blood corpuscles which are believed to aid in the clotting of the blood.

The symptoms disappeared with the discontinuance of the use of aspirin. However, the doctors pointed out, they were unable to determine positively the connection between the taking of the asprin and the reduction of a number of colorless blood corpuscles.

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THE PLAN FOR MEDICAL SERVICE IN MISSOURI'S CIVIL DEFENSE PROGRAM

CURTIS H. LOHR, M.D.*
CLAYTON

THE PLAN for medical service in connection with the State of Missouri's Civil Defense Program has been prepared jointly by Capt. C. Hungate, MC-USNR and myself at the requests of Dr. Buford Hamilton, State Director of Public Health, and of the Council of the Missouri State Medical Association. The work has been conducted under the auspices of the Association's Committee on Emergency Medical Service. In the performance of the task, assistance has been given by a group of special advisors who were selected on the basis of their special qualifications and experience gained during their military service in World War II. The names of these physicians, their respective rank in the Civil Defense organization and their present duty assignments are listed in the accompanying roster of key personnel. The invaluable services which these physicians have rendered in the development of this state's Civil Defense Medical Service are acknowledged gratefully herewith.



CURTIS H. LOHR

Thanks to the concerted efforts of this group, it was possible to complete the medical plan early this year. It was submitted to and approved by the Council of this Association at its Annual Session. It was then presented to the State Civil Defense Agency and we are pleased to report that on August 16, 1951, we were informed by Mr. R. Hammond, Director of Civil Defense in Missouri, that he has approved the medical plan as submitted. In other words, the medical plan sponsored by the Missouri State Medical Association has become and is now the official plan for medical service of the State Civil Defense Agency.

In this connection it is interesting to note that the medical plan is the first plan prepared and submitted by any professional organization in this state which has been accepted in its entirety by the Civil Defense officials of Missouri.

While in one respect the Missouri State Medical Association may be proud to have led the way in the essential work of Civil Defense, one must not lose sight of the fact that in all of its phases, including the medical aspects, the most difficult part of the task lies still before us, namely, the transformation of the Civil Defense Plan into a real and living Civil Defense Service which will function efficiently when disaster strikes our families and homes.

Essentially, this presentation is composed of three major parts. In the first part I shall present and discuss the organizational aspects of the medical service of Civil Defense. In the second part, I shall review the basic facts of atomic warfare and their dictates and effects on the medical service. In the third, I shall describe in considerable detail the tactical employment of the medical battalion of the Civil Defense Team as well as the various problems which may confront them following an attack.

We are fully aware that the inclusion of all these considerations will make this a rather lengthy discussion. Readers may accuse us of wasting their time and space in THE JOURNAL. However, we have decided to assume this risk for the reason that, based on our own experience, it is absolutely essential to have such background information if one is to be able to understand the need for the tremendous size and the complex organization of the medical service and its organizational and functional relationship to Civil Defense as a whole.

I. THE ORGANIZATION OF THE MEDICAL SERVICE FOR CIVIL DEFENSE

In planning this organization the recommendation of the Federal Civil Defense authorities[6, 7, 8] have been given careful consideration.

The organization of the Medical Service for Civil Defense as planned for Missouri is shown in figure 1. It will be noted that in this plan the basic governmental authority, the responsibility for command, for planning, supervision and correlation, as well as for service, are clearly differentiated and defined. It will be noted also that there are successive echelons of authority and responsibility descending from the overall state level down through the regional, Councilor District and county level of Civil Defense. This arrangement recognizes the principle that at all levels the perogative of authority goes hand in hand with responsibility and hard work. Provision also is made for adequate supervision and correlating and for adequate check and balance between the functions of command, planning and execution. Under this scheme of organization there can be no question as to who will do what and who is responsible for the success or failure of an assigned mission.

The General Staff Concept

Attention is directed to the provision for a General Staff Section which is divided into four groups: Personnel, Intelligence-Operations, Plans and Training and Supply and Logistics. Those who have served in the armed forces will recognize that this concept is not original but that we have borrowed this phase of the organization from the military.[1, 2] We admit being guilty of plagiarism but as all have learned during military service to appreciate the value of and the actual necessity for a

* Colonel, MC-USAR.

The author certifies that none of the technical and tactical data pertaining to the medical aspects of atomic warfare presented herein have been obtained from official or "Restricted" sources but have been taken from governmental and private publications which have been released for public sale.

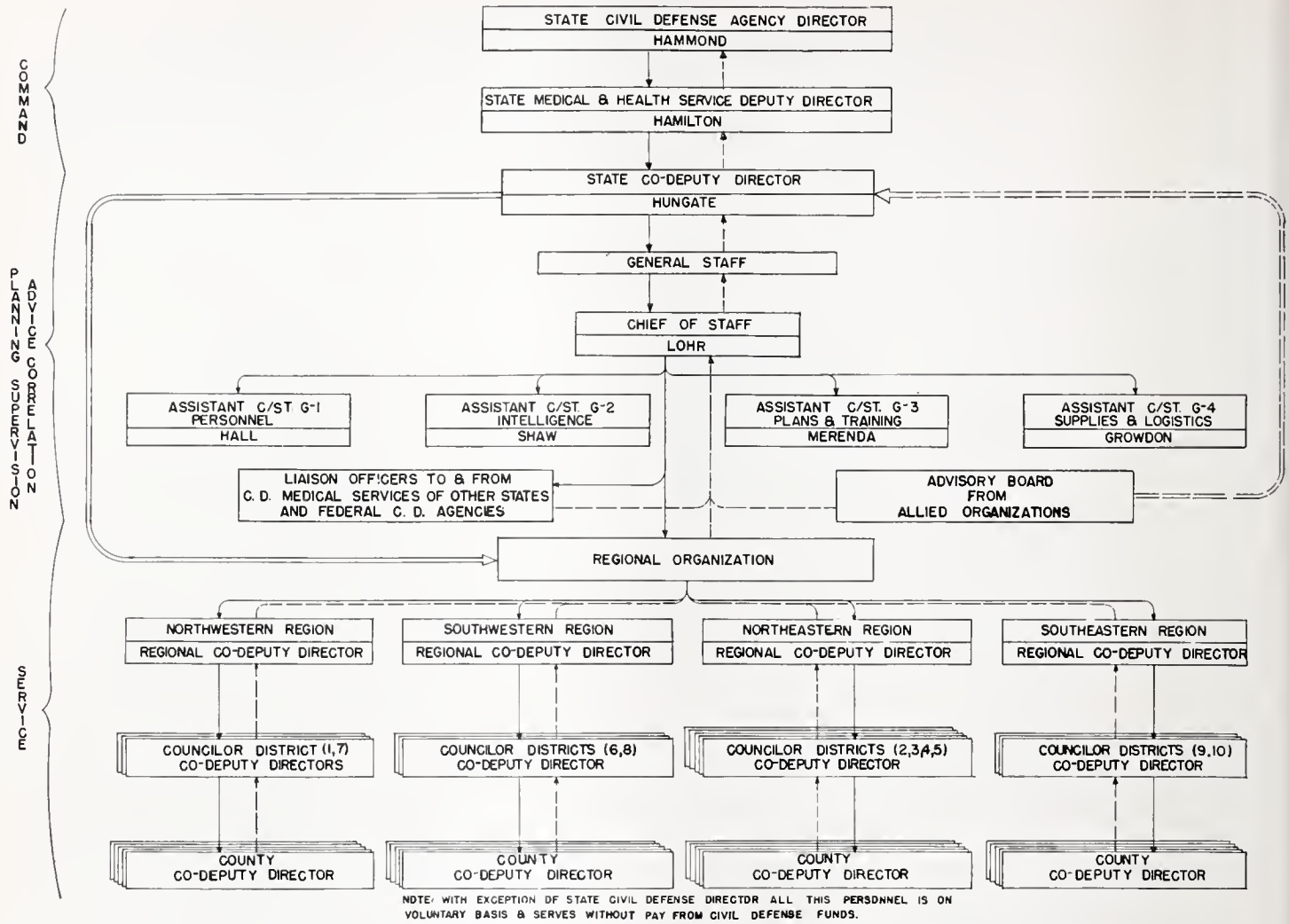


Fig. 1. Missouri State Medical Association Plan for Medical Service in Civil Defense at state level.

general staff section in large scale military or other emergency operations, we have deemed it essential to include a general staff section in our organization.[3, 10] The merit of the general staff section which is interposed between the command and the functional level of military units down to the company level is beyond question. The general staff concept has paid impressive dividends in two World Wars and it is demonstrating its value once more under the unusual conditions of the present "police action" in the Far East.

We are convinced that our decision to include a general staff section in our plan for medical service in civil defense is basically sound. It has proven itself already by the speedy completion and the thoroughness of our medical plan. When one looks at the rather fantastic staff organizations which have been adopted by other Civil Defense Agencies in complete disregard of the combat tested military staff system which is available to everyone for the asking, one cannot help wondering how such Civil Defense services will stand the test of service in a major emergency.

In figure 2 is presented the Medical Plan at the Regional and Councilor District level. Under this arrangement the State of Missouri is divided into four geographic regions and each of them is under the direction of a physician with the rank of Regional Deputy Director. It will be his duty to direct and supervise the formation and function of the Councilor District Medical Service. The Regional Deputy Director may appoint the Councilor of a given district as the director of the district or, if indicated, the Regional Director and the Councilor may designate some other specially qualified physician for that position.

The various functions which are proposed for the Councilor District organization are as follow:

a. The formation and training of a medical battalion as an integral part of the respective Councilor District's Civil Defense Team which is the basic field unit which, upon call, will proceed to and will serve in the disaster area.

b. The formation of a Mobile Medical Group of physicians and members of the allied profession which, upon call, will proceed to the disaster area and will reinforce the staffs of the surviving hospitals in the target city.

c. The formation of a District Blood Center and staff which, when the call for blood is received, will direct and supervise the collection and typing of fresh blood in the component counties of the district concerned, as well as its delivery to the target city.

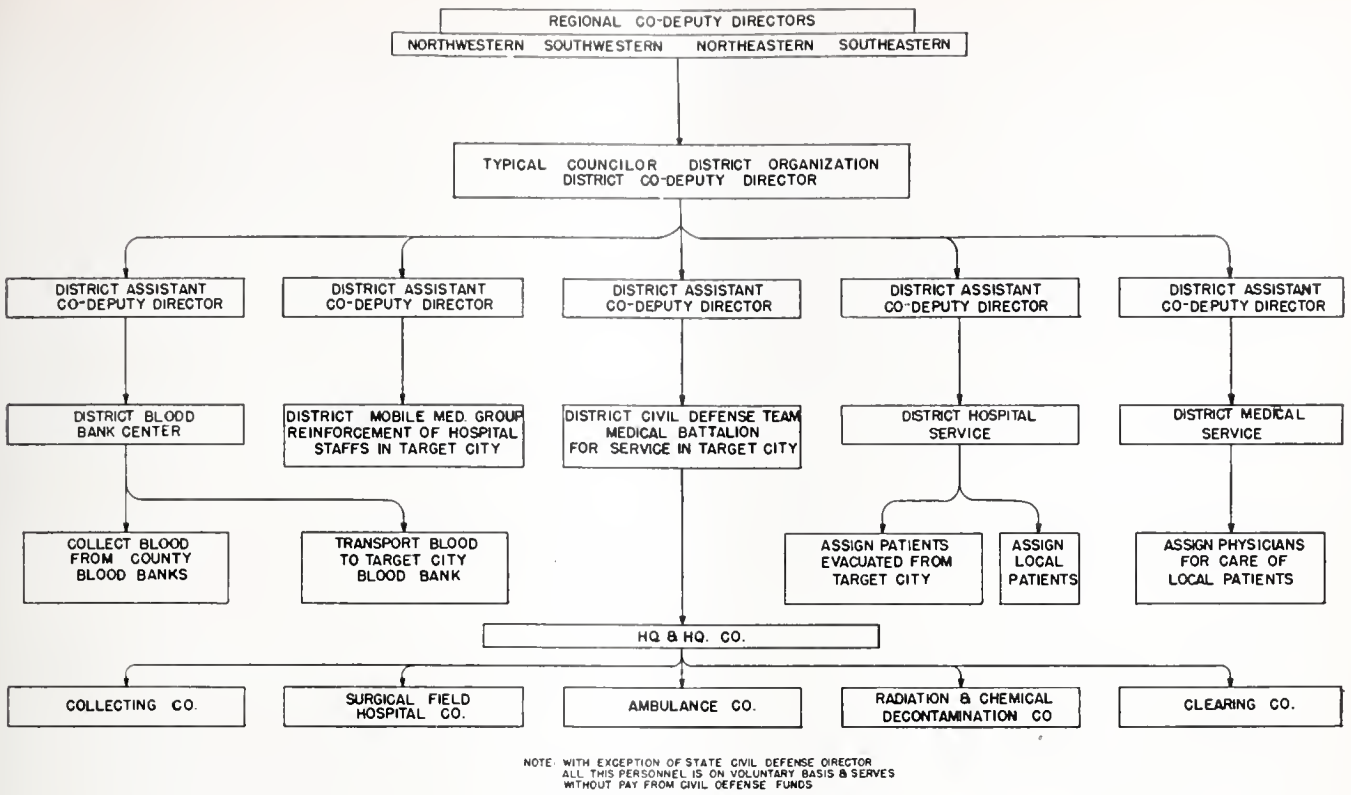


Fig. 2. Missouri State Medical Association Plan for Medical Service in Civil Defense at regional and Councilor District level.

d. The formation from among the district's remaining physicians and members of the allied professions of two "Home Service Groups" in order to assure proper maintenance of local hospital service and home and office care of the citizens residing in the Councilor District. The hospital service section of this group will also be expected to provide medical care for a designated number and type of disaster victims if it becomes necessary to evacuate them from the target city.

In reference to the latter, I wish to point out that, in our opinion at least, it is not feasible to evacuate fresh casualties from the disaster area to outstate hospitals immediately after the attack. It is felt that such evacuations should be delayed if at all possible until after the patient has had definitive medical and surgical care in his home city and until there has been sufficient time to evaluate the number and type of the casualties in relation to the capabilities of the medical services in the target city and in outstate districts.

In figure 3, organization and functions of the

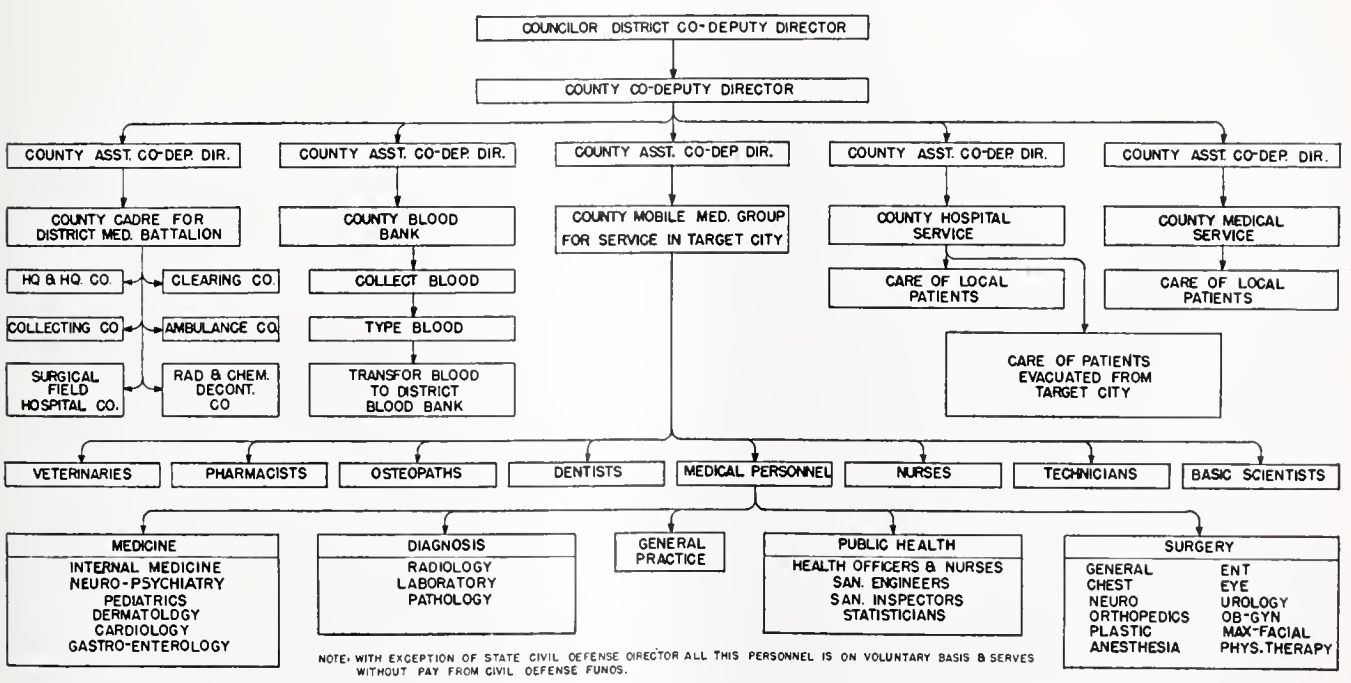


Fig. 3. Missouri State Medical Association Plan for Medical Service at county level.

Medical Service are depicted at the County level. Basically, it is the same as at the district level except that the contributions in personnel and service are limited to the capabilities of the respective county's smaller area, population and resources.

This figure shows also the types of professional personnel which are needed to make up the Mobile Medical Group which will proceed to reinforce the depleted staffs of the surviving hospitals in the target city. Suffice it to say that when D-Day comes, all who are qualified to treat the injured

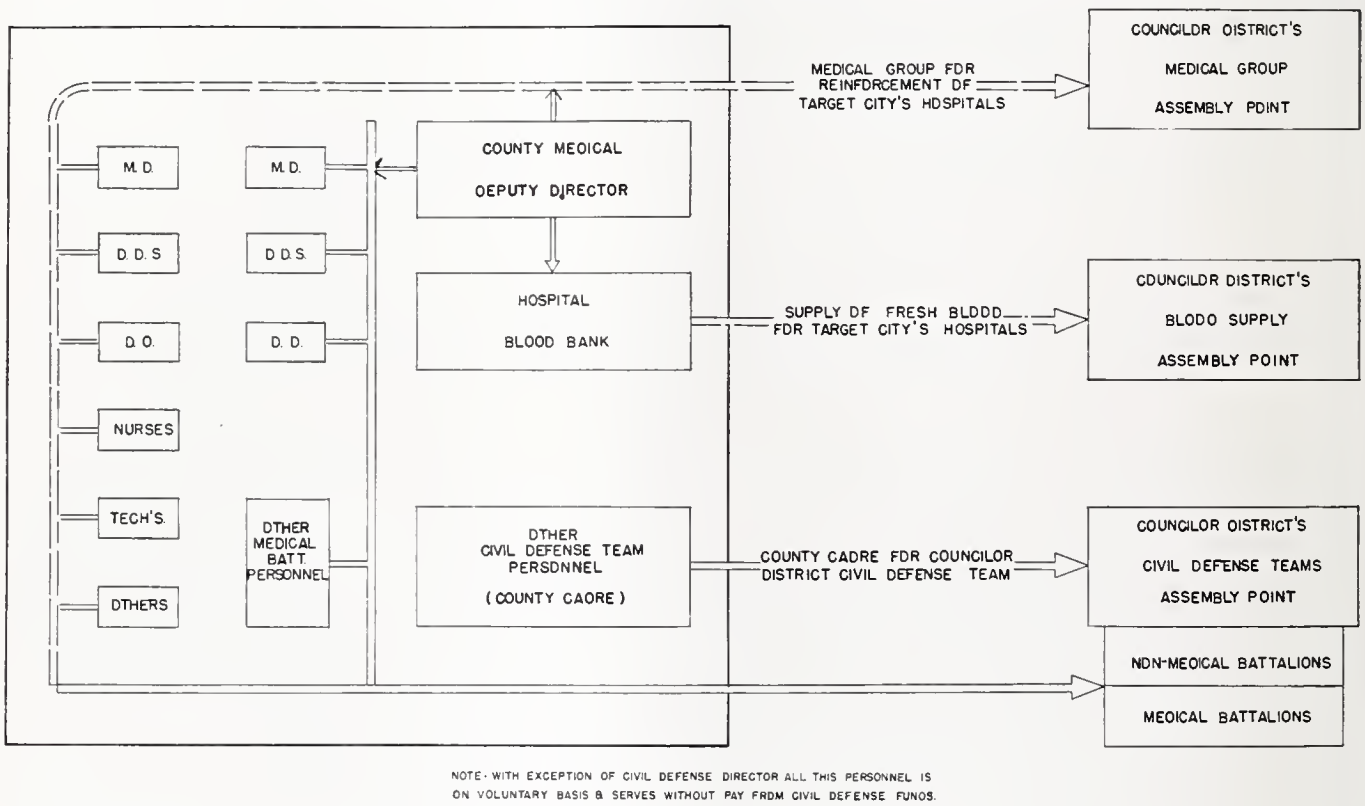


Fig. 4. Scheme of mobilization at county level.

and the sick will be needed and must be willing to serve. We contend, with due respect to our colleagues who are specialists, that on the day of disaster the general practitioner will come again into his own.

These groups, combined with the graduate nurses, attendants, orderlies, x-ray and laboratory technicians, basic scientists, our friends among the pharmacists and the veterinarians will be a Godsend indeed. In this part of the plan we have made a mistake in that we have failed to include the morticians. Their services are especially valuable and essential and they must be part of the Mobile Medical Reinforcement Group.

Figure 4 depicts the scheme for the mobilization of the mobile groups—the county's cadre to the Councilor District Medical Battalion and the Medical Reinforcement Group for service in the surviving hospitals in the target city.

Figure 5 shows the scheme of mobilization at the Councilor District level. The mobile groups supplied by the component counties will assemble at the designated assembly points of the Councilor District and, upon order of the Councilor District Deputy Director, these groups will proceed to the target city in convoy fashion along designated routes. When they reach the edge of the target city, they will report to designated "Regulating Officers" at designated "Regulating Points." At these points these groups will come under the general command of the disaster area commander. The regulating officers will assign and will guide these groups to the place of their assignment. This arrangement we believe will prevent confusion and delay at the time when every minute counts. It also will assure that their professional personnel will function where they are needed the most.

If a Councilor District's Medical Battalion arrives before the time scheduled for its employment as a replacement unit for one of the local medical battalions, the newly arrived medical battalion will be guided by the regulating officer to a designated bivouac area where its personnel will rest and hold itself in readiness to go into action at the designated time.

Up to this point the Civil Defense Medical Service at the State, Regional, Councilor District and County level has been explained. It might be expected that the next subject of discussion would be the Medical Battalion inasmuch as it is the next lower echelon of the Medical Service in Civil Defense. I beg leave to digress from this sequence because it is deemed advisable to discuss the agency which creates the Medical Battalion and the Civil Defense Team of which they are component parts before we study the Medical Battalion itself.

It is noted in figures 2 and 3 that the Civil Defense Teams and their component battalions are created at the Councilor District level or, as in the areas like Jackson County, St. Louis County and the City of St. Louis, at the county or city level. In order for such governmental subdivisions to be able to create such field units of major size and strength, it is obvious that the areas from which they originate must have an agency to do this job. This is actually the case and in all these respective areas there is now or will be a so-called Civil Defense Agency for this and other purposes.

In view of this, and inasmuch as these Civil Defense Agencies are the parents of the Civil Defense Teams and their Medical and other Battalions, it is deemed advisable to review the organization of the parent unit before its offsprings are studied.

A Local Civil Defense Agency (St. Louis County)

In figure 6 is found a description of the organization of a typical county Civil Defense Agency (St. Louis County). Attention is directed again to the clear cut separation between the local governmental authority, the function of command, the functions of the General Staff in planning, supervision, correlation and of giving technical advice to the Commanding Officer of the Agency and to his Subordinate Commanders of the component services. It will be noted that the echelons of command, advice and service are the same as shown previously in figure 1 which deals with the overall organization of the Medical Service at the state level.

A Civil Defense Team (St. Louis County)

As stated previously, it is the task of the component services of the respective Civil Defense Agency to create one or more Civil Defense Teams which are the field or tactical units which will go into action at the time of disaster. On occasions they are referred to, in a humorous but realistic vein, as the "pick and shovel boys" of Civil Defense.

The organization of a Civil Defense Team is shown in figure 7.

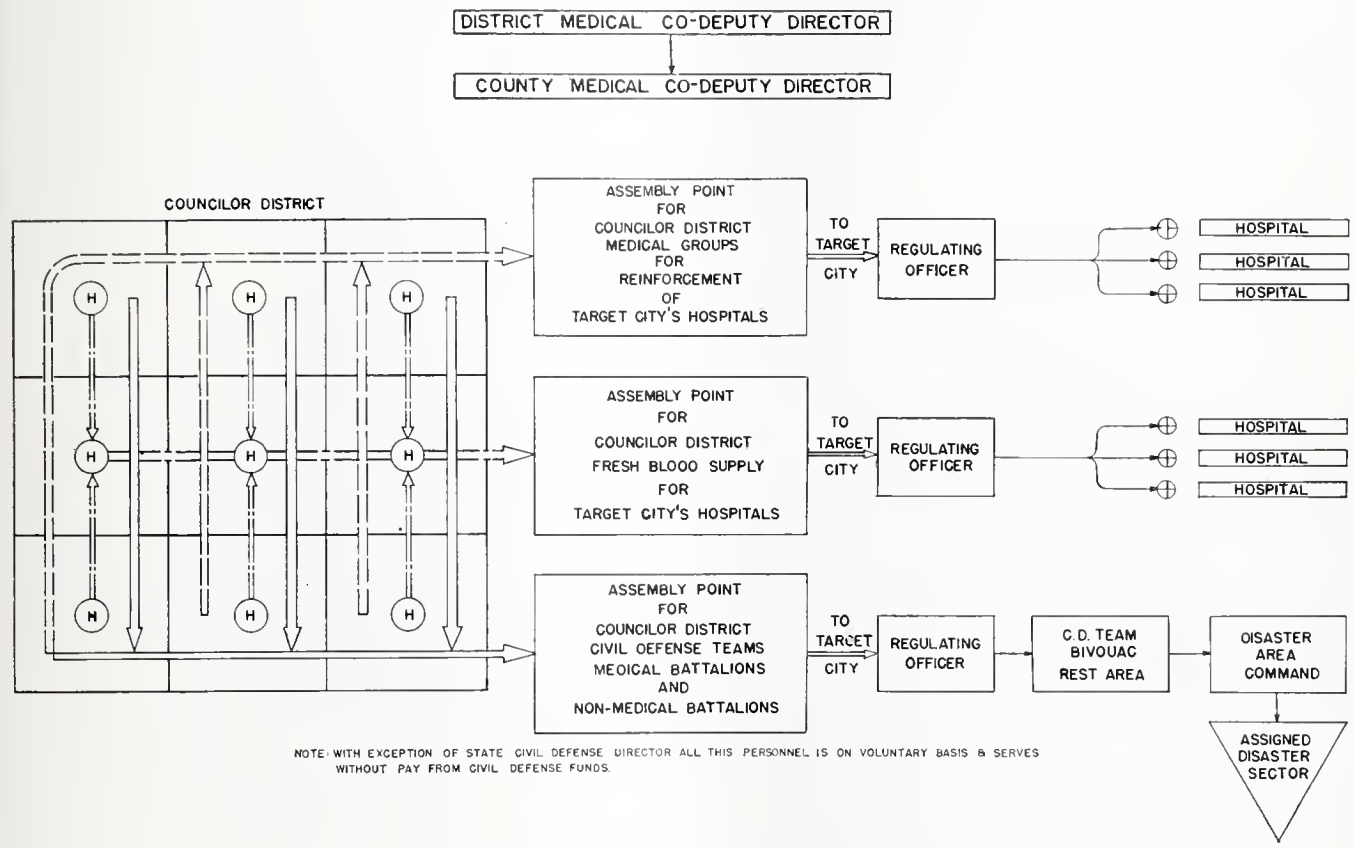


Fig. 5. Scheme for mobilization at Councilor District level.

Insofar as the size, strength and self sufficiency are concerned, a Civil Defense Team reminds one of the Reinforced Regimental Combat Team of World War II. Just like the latter, it is numerically of greater strength than the ordinary regiment. Likewise, it is an all inclusive unit which contains in its organization all of the technical services which it may be called upon to render in the fulfillment of its mission. Aside from the general supervision and direction of the disaster area commander it functions independently in the attainment of its objective in its assigned sector of the disaster area and it neither requires nor receives support from other units or agencies. It is obviously highly mobile; its manner of organization is such that it is highly flexible and it can adapt itself easily to the constantly and rapidly changing conditions of disaster situations.

The many types of technical services which a

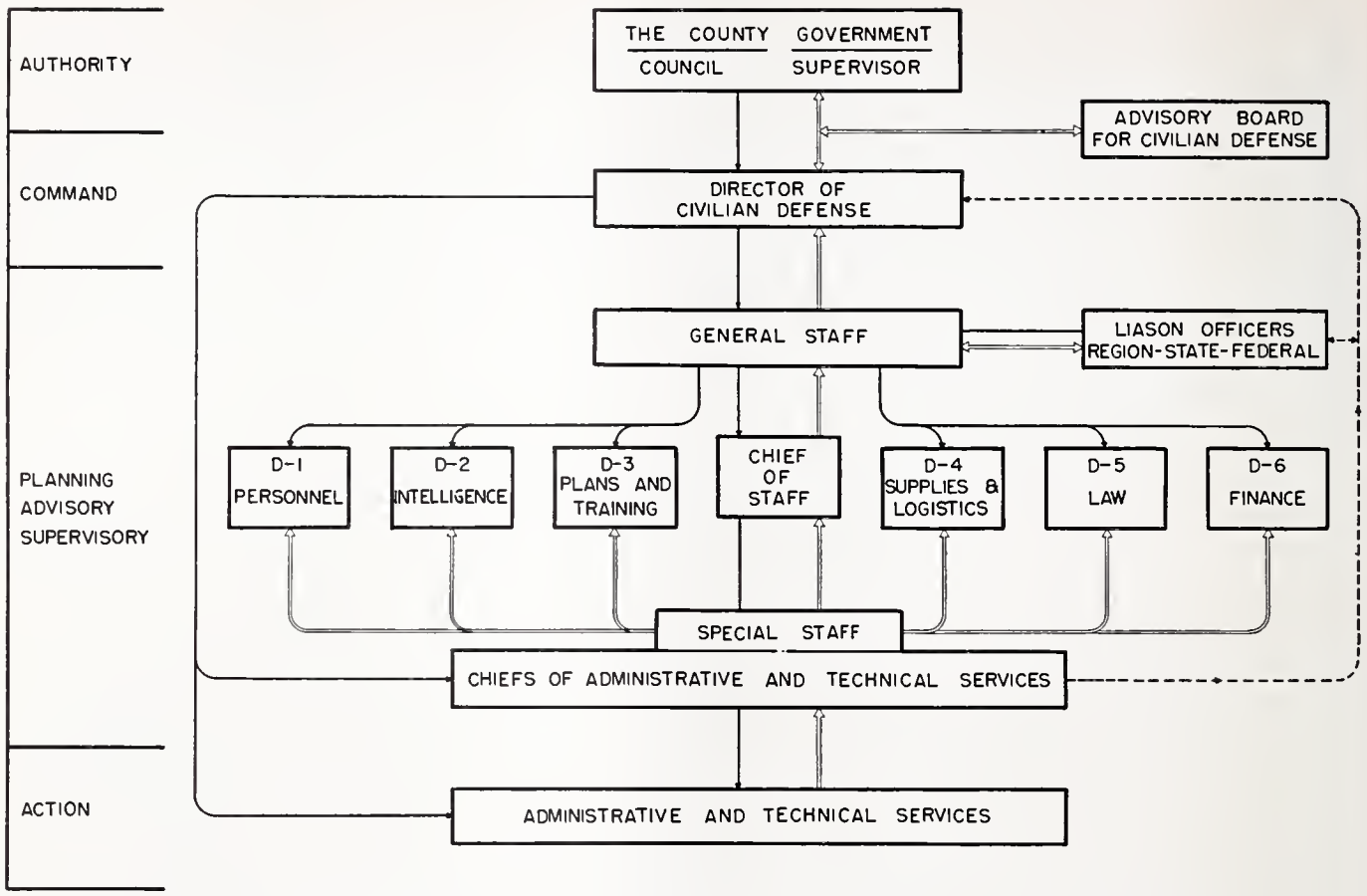


Fig. 6a. Organization of a county Civil Defense Agency (St. Louis County).

Civil Defense Team must render are supplied through its component battalions who are so named as to identify their respective functions.

While, excepting the Medical Battalion, time and space does not permit a detailed description of the services of the various battalions in time of action in the disaster area, the summary given in table 1 should suffice to give a clear picture of the various functions of a Civil Defense Team and its subordinate battalions.

Inasmuch as the physicians of this state will be especially interested in the organization and function of the medical service in which many of them will participate in the near future, the following description of a Medical Battalion will be extensive and in considerable detail.

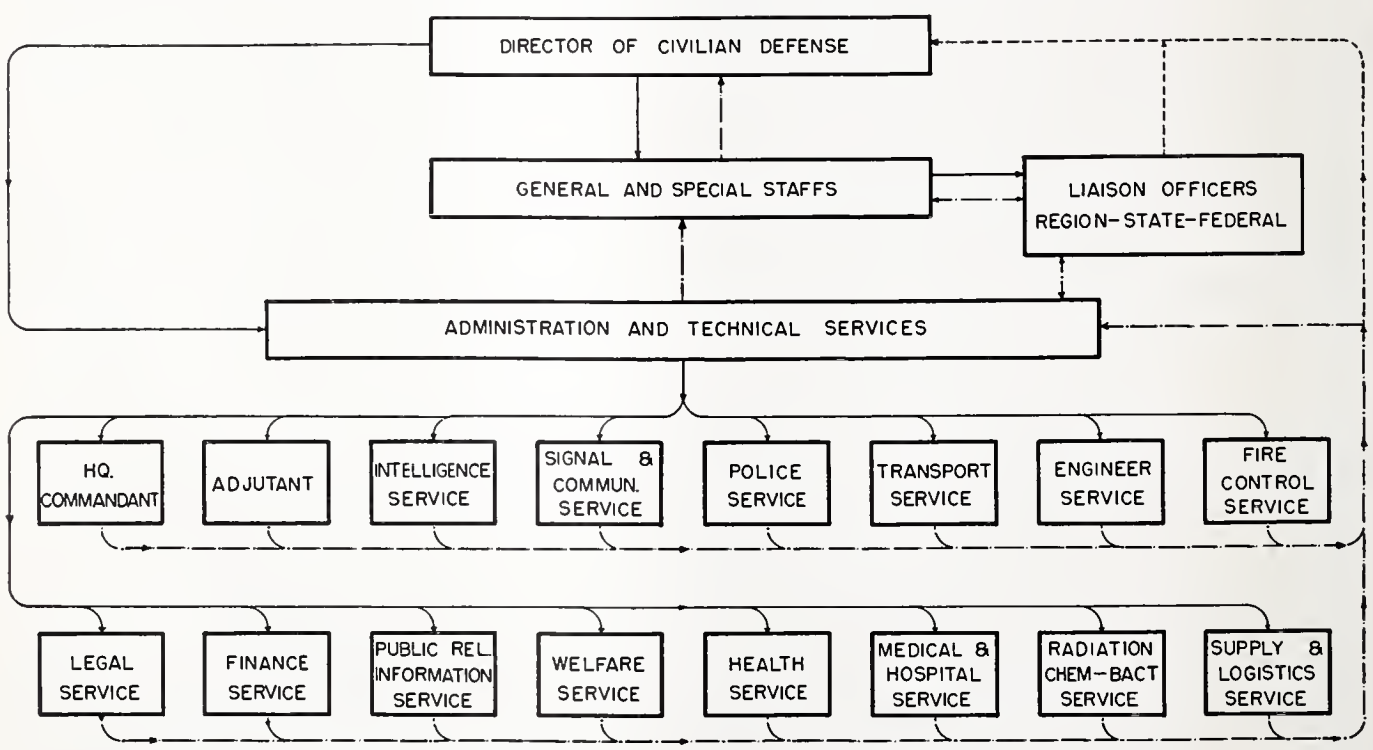


Fig. 6b. Organization of a County Civil Defense Agency, Administrative and Technical services (St. Louis County).

The Medical Battalion

In preface to this description of the organizational aspects of the Medical Battalion and in order to give a true bearing in the sea of facts, fancy and philosophy of this presentation, it is timely to stress the essential fact that the Medical Battalion as a unit is the most important part of the medical service of Civil Defense. It is the field and the "pick and shovel" unit of the medical service as a whole. It is the unit for whose creation and training the entire superimposed statewide pyramid of the medical organization must plan and work.

Table 1. *Component Units of a Civil Defense Team and Its Functions*

COMPONENT UNITS OF A CIVIL DEFENSE TEAM	FUNCTIONS OF UNITS
a. Headquarters and Headquarters Company:	1. General command of Civil Defense Team. 2. Administration. 3. Operation of message and information centers. 4. Collect and disseminate "Disaster Intelligence." 5. Maintain register of all evacuees and other casualties. Transmit to Public information center of General Headquarters of Disaster Area Command.
b. Police Battalion: (This battalion is augmented upon its arrival in the assigned disaster sector by its block warden units. Prior to this time the latter function as temporary, miniature Civil Defense Teams and carry out their functions to the best of their ability.)	1. Quarantine disaster area by establishing police posts at all points where streets and roads enter or leave area—in between, post perimeter guard. 2. Maintain order and discipline in disaster area. 3. Guarding of stores, banks, plants and homes against looting. 4. Effect Panic Control. 5. Effect Traffic Control. 6. Accompany convoys. 7. Supervise, direct or employ block warden units after their primary duties have been accomplished.
c. Transportation Battalion:	1. Supply vehicles to all units without organic transportation—supplement other units on call. 2. Establish and operate refilling points for gas, oil, air and minor repairs. 3. Evacuate welfare casualties under direction of Welfare Battalion.
d. Communication and Signal Battalion:	1. Establish and maintain emergency communication system (field telephone, radio—visual signals—runners). 2. Establish and maintain radio communication with observation planes of General Headquarters of disaster area.
e. Engineering Battalion:	1. Clear streets and roads of debris and make emergency repairs. 2. Operate rescue teams. 3. Repair and reestablish electric, gas and telephone lines, water supply and sewer mains. 4. Effect emergency repairs of structures used by Civil Defense Team. 5. Effect demolitions as directed by fire chief.
f. Fire Control Battalion:	1. Contain fires within core of disaster area. 2. Fight spot fires in rest of disaster area.
g. Radiological, Chemical and Biological Defense Battalion:	1. Provide radiation monitoring for disaster area, casualties and personnel. 2. Establish and operate decontamination stations as needed.
h. Welfare Battalion:	1. Locate, register and evacuate all uninjured persons in disaster area sector (vehicles supplied on call by Transportation Battalion). 2. Assign evacuees to compulsory billets in undamaged part of target city. 3. Issue canned rations and necessary clothing to evacuees. 4. Supply chaplain's services. 5. Supply services of various social agencies as needed.
i. Health Service Battalion:	1. Locate, identify, register, evacuate and bury the dead under supervision of deputy coroners. 2. Maintain Environmental Sanitation. 3. Effect communicable disease control. 4. Effect mass immunization as needed. 5. Supervise potability of water supply and safety of sewage, garbage and refuse disposal.
j. Supply Battalion:	1. Procure, store, issue and supervise use of general supplies and equipment. 2. Effect prompt replacements. 3. Effect salvage.
k. Medical Battalion:	See detailed description below.

It is a peculiar unit. Although each Councilor District or in the metropolitan areas, the component counties and cities will have the heavy task of creating and training one or more of these medical battalions, each of them is created for a dual purpose; it is created to serve the area from which it stems as well as to give aid to other areas and cities of this and other states. In other words, the medical battalion is a mutual aid unit. It is the product of a difficult conception, a long gestation and of a hard labor of a local area. While each of these parents will be proud of and will have natural affection for its offspring, each of them will, no doubt, have the fervent hope that the medical battalion which it has organized will need not render active service to the area of its origin.

The basic organization of the typical medical battalion of a Civil Defense Team is shown in figure 8. It is obviously a large unit and the extent of its scope and its complexity are made even more clear in figures 9, 10 and 11 which depict the organization of a Medical Battalion's major and standard components which are:

1. The Collecting Company.
2. The Clearing Company.
3. The Ambulance Company.
4. The Headquarters and Headquarters Company.

The organization of these component units of a medical battalion are shown in figures 9, 10 and 11.

In addition to these components which are standard provisions for the military type of medical battalion, the latter's counterpart in Civil Defense includes, tentatively at least, two other units:

1. The Surgical Field Hospital Unit.
2. The Radiological and Chemical Decontamination Unit.

The organization and personnel strength of these two units are still under study and for this

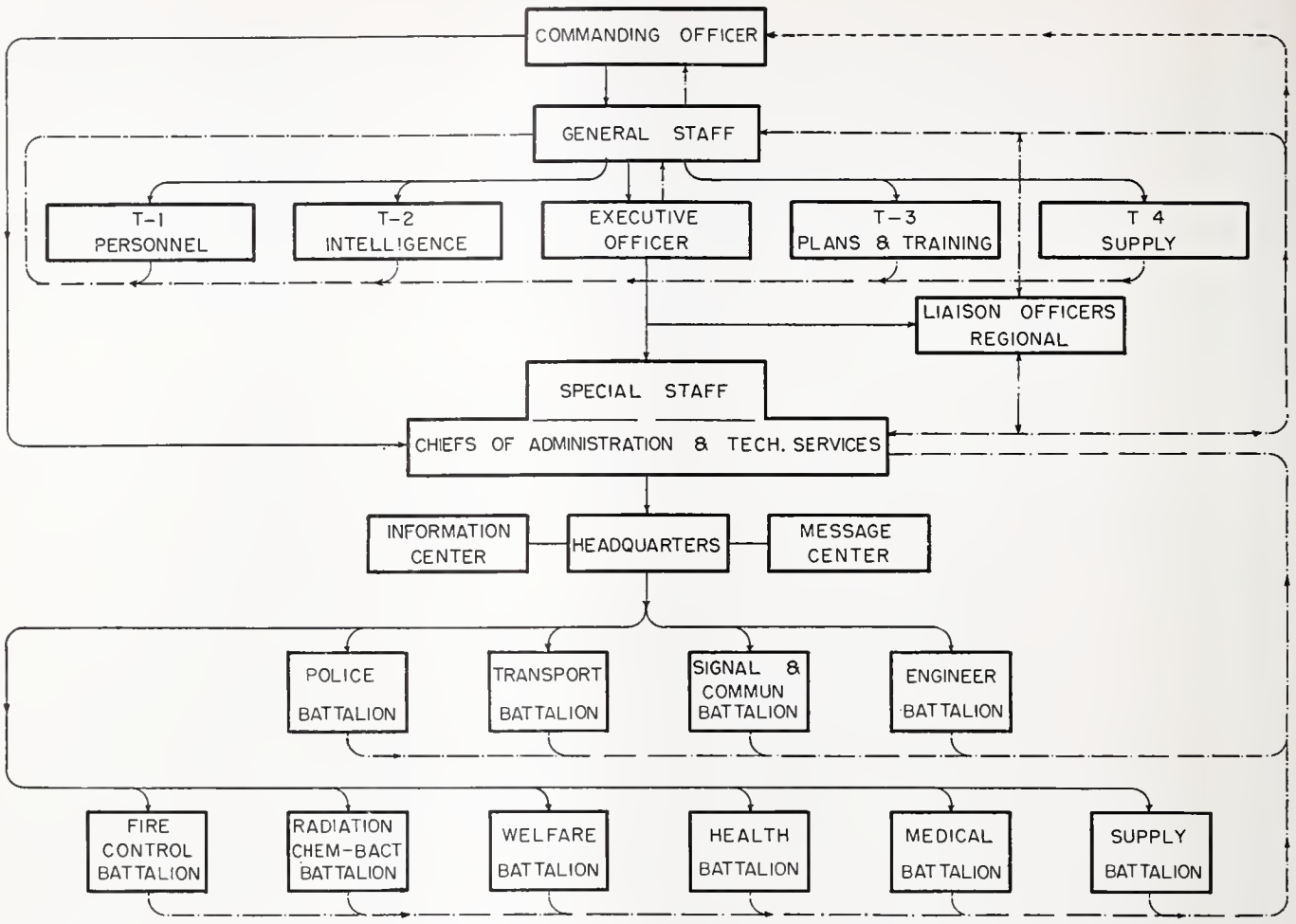


Fig. 7. Organization of a Civil Defense Team (St. Louis County).

reason no table of organization is presented at this time.

In this connection it must be pointed out, however, that, if the laudable purpose of Civil Defense to save every possible life is to be realized, a small surgical field hospital is an essential part of every medical battalion. Such a unit will be needed to care for moribund and nontransportable casualties and to perform a small but desperately needed number of surgical procedures—life and limb saving operations.

In reference to the need for a radiologic and chemical decontamination unit there is at present a considerable difference of opinion. On the basis of the Bikini and other tests, more and more observers are coming to the conclusion that ground contamination has much less potential as a casualty producing agent than it was thought in the past.

In view of this trend the need for these two units of a medical battalion is under review by the Federal Civil Defense Authorities. Pending their final decisions further work on these units of the medical battalion has been deferred.

It is interesting to note that, according to all indications, the medical battalion will probably be the largest battalion of our Civil Defense Teams. This is not surprising in view of the scope of service which the medical battalion is expected to render in an atomic disaster.

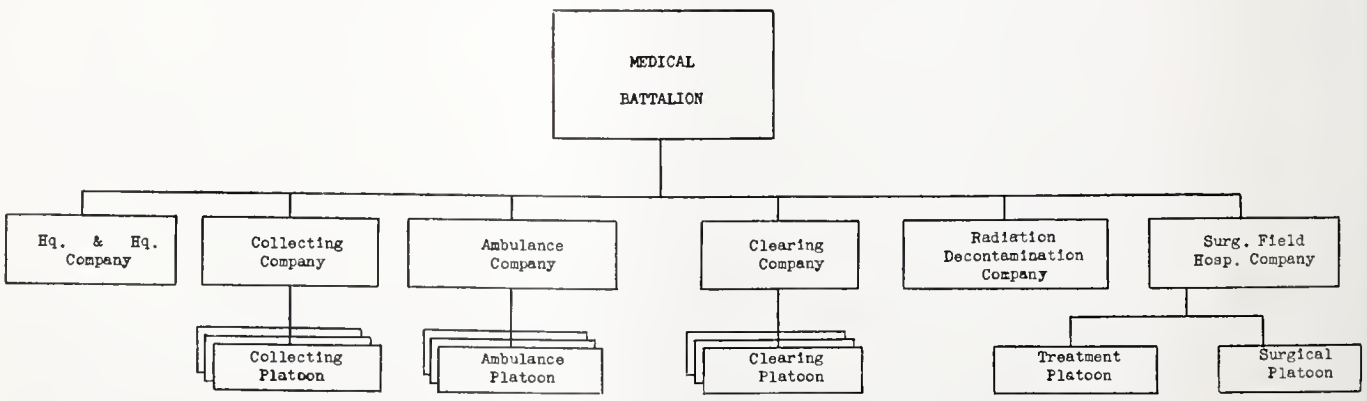


Fig. 8. Organization of a Medical Battalion.

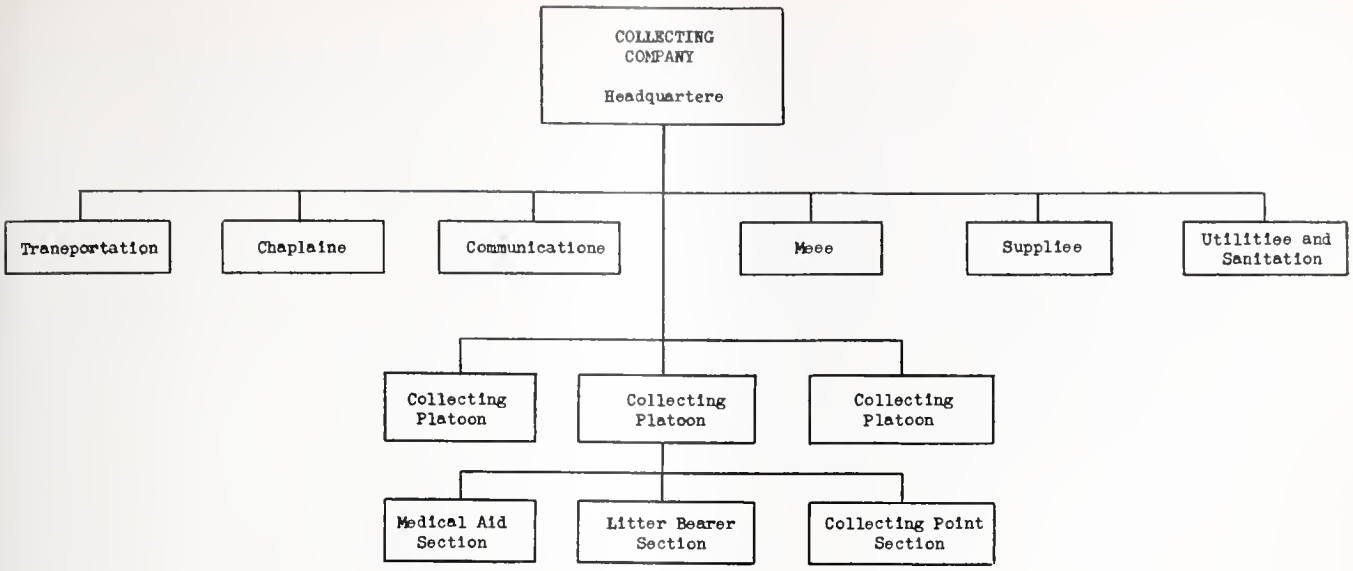


Fig. 9. Organization of a Collecting Company.

In planning the organization of the medical battalion two important points have been kept in mind:

1. The tremendous casualty load as the result of an atomic attack.

2. The need and the right of the victims of such a disaster to be assured of adequate medical care.

Insofar as the second point is concerned it was decided to aim for a standard of medical care of the type and quality of the medical service which the armed forces have been able to provide so consistently under the most trying combat conditions. For this reason, it has been deemed advisable in our planning of the medical battalion to adhere to the army pattern,[2, 3] except insofar as the size and the personnel strength of such a battalion are concerned. In these respects an upward adjustment is indicated and has been made in order to cope with the immense case load which will confront the civilian type of medical battalion following an atomic attack.

The extent of the indicated adjustment has been determined by means of detailed time and motion studies and they make it clear that the Civil Defense type of medical battalion will require between 1,250 and 1,500 officers and men if it is expected to accomplish its mission in an atomic disaster. It goes without saying that the recruitment, equipping and, especially, the training of a unit of this size will be a big and difficult task for any community which attempts such an effort.

We were fully aware of this difficulty before we adopted the type and size of medical battalion which has been approved by the Missouri Civil Defense Agency. In an effort to lighten the load of the communities which will have to provide these medical battalions, the medical plans proposed by other Civil Defense planners have been studied carefully. These studies have shown that there is no standard plan for a Civil Defense Medical Service. It was found that most of the medical service plans which have been formulated in connection with Civil Defense are more theoretical than practical and that almost none of them have

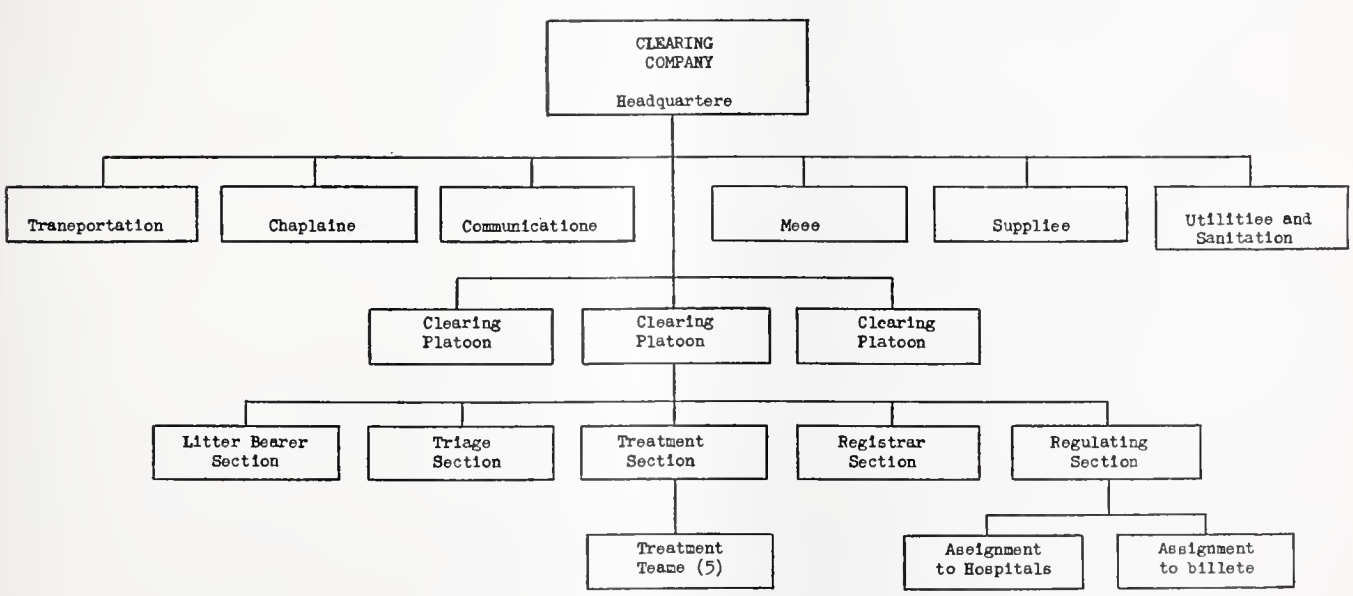


Fig. 10. Organization of a Clearing Company.

had the benefit of a performance test under real instead of simulated and often slanted emergency conditions.

The great majority of these plans sidestep the two basic points made previously—the tremendous casualty rate of an atomic disaster and the need and the rightful demand for adequate medical care of the victims in the target cities. One cannot help but feel that any plan which disregards these basic requisites is but a gesture and is bound to break down under the impact of the consequences of an atomic catastrophe.

It seems obvious that an atomic disaster is neither the place nor the time to make "noble experiments" in medical organization. As far as the staff of the Medical Service of the Missouri Civil Defense Program is concerned we find great comfort in the knowledge that the Army plan of Medical Service upon which our Civil Defense Medical Service plan is based has stood the acid test of war under the most demanding and difficult conditions in all corners of the world.[12, 13] This seems to prove, to us at least, the basic soundness and the merit of the plan upon which we have built.

Some of the Civil Defense officials whose plans have been studied admit frankly the inadequacy of their medical service plans. They give as an excuse that the public will not participate sufficiently in Civil Defense to implement a more adequate plan. While this may be true at this stage of development of Civil Defense, we have rejected this concept. We contend that such an assumption cannot be justified until after a much more forceful effort is made than heretofore to inform our citizens that their survival in an atomic attack depends on their own efforts and willingness to help themselves. Until this lesson is driven home we believe that it is the duty of Civil Defense planners not only to prepare but also to demand a medical service plan which will meet atomic disaster requirements. If, after all this has been done, the public is still unwilling to support an adequate plan by its all out participation, then the ghastly loss of life which will result from an atomic attack in an unprepared community will rest squarely where it belongs—on the shoulders of our fellow citizens. If, on the other hand, we propose, unbeknown to the public, an inadequate medical plan with the excuse to our conscience that such a "token" plan is all that the public will support, then, when on D-day the injured cry in vain for medical care which does not exist, their suffering and deaths will be the responsibility of the Civil Defense officials concerned.

If such a catastrophe should be our fate, we would prefer the mercy of a timely demise in the crash and flames of the debacle which we helped to create to the final reckoning with those whose to create instead of facing those whose trust we failed on the final day of reckoning.

In concluding Part I of this presentation—The

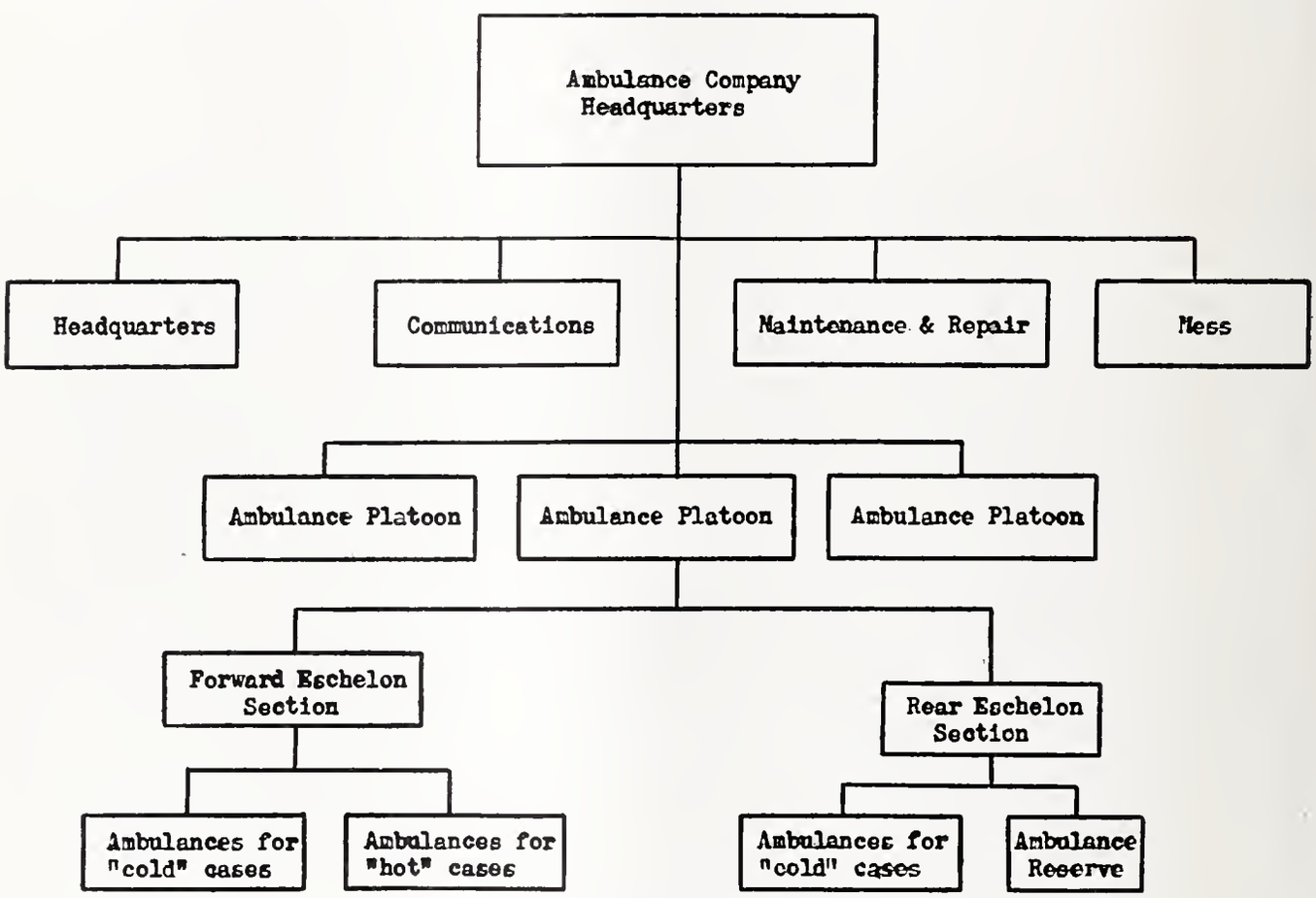


Fig. 11. Organization of an Ambulance Company.

Organization of the Civil Defense Medical Service —it is hoped that the reader will agree with the thoughts upon which our decisions pertaining to this phase of the medical plan of this State's Civil Defense Program have been based. Constructive criticism is solicited, will be appreciated and will receive careful consideration.

In part II the basic facts of an atomic attack will be presented.

II. THE BASIC FACTS OF AN ATOMIC ATTACK

In order to understand and to pass judgement on the plan of organization and on the tactical use of the Medical Service of Civil Defense, it is necessary to be informed on the basic facts of the atomic bomb and the destruction and problems which it creates.

The fundamental and pertinent considerations which affect the planning and the utilization of medical service[9] in an atomic disaster are as follow:

1. The destructive forces released by the atomic bomb.
2. The characteristic efforts of these destructive forces.
3. The casualty rate and its modifying factors.

1. *The Destructive Forces Released by the Atomic Bomb*[5]—When an atomic bomb is detonated, the destructive forces which are released are:

a. A blast wave of tremendous force.

b. A heat wave with an initial temperature of 4000 C at its periphery.

c. A radiation wave composed of several types of radio-active rays which vary in their power of penetration and which emenate from the particles of atoms which have undergone fission prior to and during the detonation of the atomic bomb.

2. *The Characteristic Effects of the Destructive Forces of the Atomic Bomb.*—When such a bomb is exploded as an "air burst" the destructive forces which are released will produce effects whose physical characteristics are illustrated in figure 12.

This sketch shows that the destructive effects are distributed over an area which has approximately the shape of a circle with a diameter and radius of 5 miles and 2.5 miles respectively. This characteristic may be modified by peculiarities of the terrain, such as mountain ridges or scattered hills.

The circle generally is referred to as the "Disaster Circle."

The other characteristics of the disaster circle are: circumference, 16 miles; area, 20 square miles; population: variable.

The radius and the diameter of the circle, the mileage of its circumference and its area in square miles are of major importance in their relation to the tactical problems involved in bringing medical care to the victims of an atomic attack by means of the field units of the medical service—the medical battalions.

Variations in Destructive Effects in Different Types of Attack

The destructive effects of these three forces vary considerably depending upon where, in relation to the target, the bomb is exploded. If the bomb is detonated 2,000 feet above the target it is called an "air burst." While the casualty effect of radiation is substantial, it is no where as extensive as the effect of heat and blast. It is estimated that the latter two forces account for 85 per cent of the casualties and that radiation produces only 15 per cent. In addition there is a relatively small amount of ground contamination with its resulting lingering radiation and casualty effects. It is now believed generally that the casualty effect of ground contamination is no where near as great as thought heretofore.

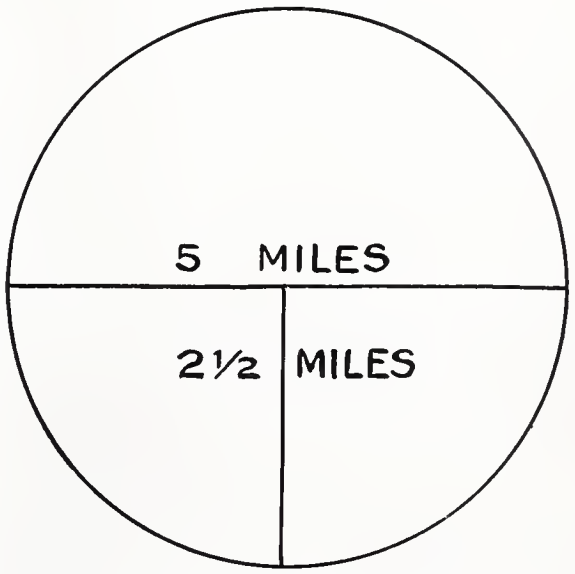


Fig. 12. The Disaster Circle.

When the bomb is exploded on the ground it is called a "ground burst." In this type of attack the descending cone of heat and blast is small and consequently the number of burn and blast injuries are much less than in an air burst. As one would expect in a ground burst the amount of ground contamination is maximal and constitutes a perplexing and serious problem.

In a "water burst" the atomic bomb is set off either on the surface of the water or below it. This method of attack is not likely to be used in Missouri because there are no large bodies of water in close proximity to worthwhile target cities. However, a "water burst" might be the method of choice in an attack on coastal cities. While here again the casualty effects of blast and heat are not of major scope, this type of burst will create severe radio-activity of the water which is displaced by blast of the explosion. As this mass of water descends on the target city in the form of a highly radio-active rain it produces widespread contamination, lingering radiation and extensive casualties.

Speed of Destructive Effects

Another important characteristic of an atomic explosion is the split second speed with which the forces of blast, heat and radiation released by the explosion produce their primary destructive effect and also that these forces reach the gamut of their destructive course within a second or two. Fortunately, the intensity of the three destructive forces decreases rapidly and by the time they have traveled to the periphery of the disaster circle their destructive effect has become insignificant.

Sheltering Effect

While the high speed with which the blast, heat and radiation produce injury and death offer but little hope for escape, they have one fortunate characteristic which affords a chance for survival and for prevention of serious injury. The possibility of escaping serious or fatal injury when one is caught exposed in the open depends on the lucky fact that the waves of blast and heat and the radio-active rays travel in straight lines and that solid objects in their paths give a sheltering effect. It is this characteristic, combined with the span of grace of a second or two seconds, which may enable an alert person to find protective shelter in a ditch behind a tree or fence or behind some other solid object. Although the sheltering effect may not afford complete protection against the shock and heat wave and, especially against the penetrating gamma rays and neutrons, it will reduce the extent of injury and it may save many lives.

In view of the power and the speed with which the forces of blast, heat and radiation exert their destructive effects it is not surprising that they leave an area of chaos, destruction and despair in their wake.

Description of Destruction

Through our knowledge that the blast wave is a tremendous force we can understand how and why most buildings in the inner third of the disaster circle will be destroyed except those of the most modern and strongest construction of the combined steel and concrete type. The power of the blast will injure persons by slamming them against the ground and other solid objects. Many people who escape the direct effect of the shock wave will be injured when their dwellings are pushed over by this force. As the blast wave travels outward it leaves a vacuum in its wake. When the blast has run its outward course there will be a counter flow of air back into the vacuum. This phenomenon produces winds of cyclonic force and and speed and they in turn will cause much additional damage. As the high speed winds sweep through the area they pick up and carry various bits of debris. In this manner these bits of wood, steel or stone become high speed missiles which will produce a large number of lacerations and penetrating wounds. As houses and other buildings are destroyed by the shock wave the streets and roads will be blocked by piles of rubble and debris. All transport, electric and telephone service will be destroyed. Many water, gas and sewer mains will be disrupted. Live wires will produce fires which the high winds will fan into a veritable "fire storm"; the latter will spread rapidly and will be difficult to confine within the disaster circle.

The heat wave will cause many secondary fires, among the combustible rubble of the destroyed buildings and their contents and explosions of escaping fuel gas will result. Persons who are caught without shelter in the open will suffer varying degrees of "flash burns." Persons who cannot escape from burning houses will suffer flame burns; in severity these burns will range from minor to fatal injuries.

The radiations emanating from the radio-active particles of the fissioned atoms will produce many casualties among the inhabitants of the inner section of the disaster circle. The gamma rays and neutrons are penetrating rays which produce an ionizing effect in the tissues of those who are within their range. The degree of the injuries which they cause is proportionate to the length and the proximity of the exposure and the dosage of radiation which the victim absorbed. The resulting radiation sickness may manifest its symptoms within several hours or it may be days or even weeks before the symptoms will appear. Here again, the extent of the effect varies between minor and fatal injuries.

Aside from the effects of direct exposure to radiation there is also the danger of indirect radiation as a result of the ingestion of radio-active food or drink. Additional radiation casualties may be produced by the so-called "fall-out" phenomenon. The latter consists of radio-active particles of the bomb and its contents which, after the explosion, remain suspended in the air and are carried by the prevailing winds. Sooner or later these particles "fall-out" of the atmosphere and may produce additional casualty effects at a considerable distance from the site of the attack.

As disturbing as the preceding description of the destructive effects of blast, heat and radiation may be, there is some consolation in the fact that the intensity and power of these three destructive forces of the atomic bomb are reduced rapidly and progressively as they run their course from ground zero, the point on the ground directly below the explosion, to the periphery of the disaster circle. The following figure illustrates this characteristic:

The Japanese studies and the results of subsequent tests have shown that the inhabitants and contents of the area within a radius of one half mile of ground zero are doomed to almost certain destruction, or a best to major damage and injuries.

For a distance of three fourths of a mile beyond this central area the destructive effect will be less complete but will still be serious in extent. Beyond that point the incidence of the destructive

effect tapers off rapidly until at and beyond the periphery of the disaster circle the damage is minor in scope.

3. *The Casualty Rate and Its Modifying Factors.*—*(a) Definition of "Casualty."*—Before discussing the number of casualties which one may expect as the result of an atomic attack of the "air burst" type it is necessary to point out the difference between the meaning of the term "casualty" as it is ordinarily used and as it is used in the planning of Civil Defense.

Under normal conditions the term "casualty" refers clearly to a person who has suffered an injury and who therefore is in need of medical and hospital care and the food and shelter which these services and resources provide. In our work we have come to use the term casualty on a much broader scope. As a result we apply the term not only to the injured but also those persons who reside in the disaster circle but who have not been injured. We deem it proper to refer to these persons as casualties because, while they do not need medical and hospital care, they do require various other services which make them a problem and a responsibility of the Civil Defense Service. Just like the injured they will have to be screened, registered and evacuated from the disaster circle. They will have to be housed, clothed and fed and all these services will have to be supplied by the field units of the Civil Defense Service. Inasmuch as these uninjured persons receive this aid from the "Welfare Service" of the Civil Defense Field Units we have decided to identify them as "welfare casualties"; in distinction from this group we use the term "traumatic casualties" when we speak of inhabitants of the disaster circle who have been injured and are in need of medical care.

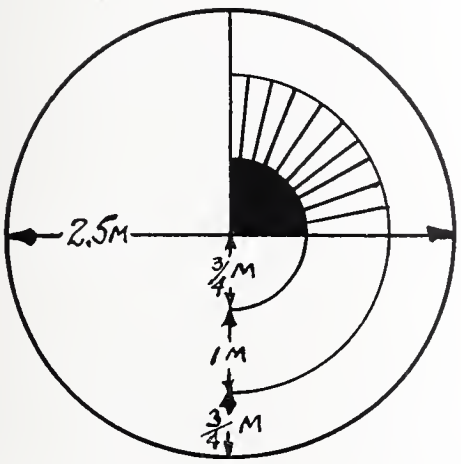


Fig. 13. Variations in extent of destructive effects.

b. *Number of Casualties.*—When an atom bomb hits its target, it will, as explained previously, produce a destructive effect in a circle like area covering 20 square miles. Everyone in the disaster circle will be affected. There will be a tremendous number of dead and injured. Even those who are lucky enough to escape physical injury will become casualties of the welfare type. They will either loose their homes and possessions or, at any rate, they will become displaced persons because the entire disaster circle will have to be evacuated in order to cope with the disaster.

On the basis of these facts, it becomes apparent that the total number of casualties produced by one atomic bomb which is detonated by an "air burst" will be equivalent to the number of persons which are in the disaster circle at the time of the explosion. This being the case, it is also clear that the number of casualties is directly proportionate to the population density of the target city. This relationship is illustrated in table 2.

Table 2. *Casualties and Density of Population*

Locality	Area	Population	Area of Disaster Circle	Population of Disaster Circle	Number of Casualties
St. Louis County	500 sq. mi.	405,000	20 sq. mi.	16,200	16,200
City of St. Louis	61 sq. mi.	853,000	20 sq. mi.	285,000	285,000

This type of estimate assumes that the density of population is fairly uniform throughout the target city. If that is the case, like it is in the City of St. Louis, the resulting figure is reasonably accurate. In the case of St. Louis County the estimate of the number of casualties is wrong because the population density varies greatly in its area of 500 square miles. However, if the facts as to uniformity or variability of the population density are known, the number of casualties (all types) can be estimated with an acceptable degree of accuracy.

c. *The Factors Which Modify the Casualty Rate.*—In addition to population density, there are several other factors which conceivably may have a modifying effect on the incidence of casualties. These factors, in the sequence of their relative importance, are as follow:

1. Population density.
2. Adequacy and efficiency of Civil Defense Service.
3. Morale and discipline level of the public.
4. Time interval between alarm and attack.
5. Number of atomic bombs dropped.
6. Type of bomb drop: air, ground or water.
7. Concurrent drop of demolition and incendiary bombs.
8. Destruction potential of new model atomic bombs.
9. Resistance potential of prevailing type of building construction.

The first factor has been discussed. The second and third factors are of obvious importance because, as pointed out by the students of our bomb

drops in Japan, thousands of lives could have been saved if the Japanese had made the slightest preparation for such an eventuality.

The remaining factors are difficult to evaluate. They contain many intangibles and variables, and, depending upon which factor is used, the estimated casualty rate can be adjusted almost at will. It is on this account that the Civil Defense literature is so full of conflicting casualty estimates.

In order to be sure that our casualty estimate will not be too low with the result that our plan for defense will be inadequate, we have disregarded all the favorable factors. We have deliberately used the Japanese figures which, unless several atomic bombs are dropped, will probably be maximal, in keeping with the hard facts of atomic warfare. We decided to plan for the worst possible situation because in case our estimate is too high and our plan overshoots the need, we have lost nothing. If a mistake is made, we would rather have it be an overestimate instead of fooling the public and ourselves with a low estimate which will lead to an inadequate plan. Such a mistake would have to be paid for, using Winston Churchhill's words, "in blood and sweat and tears." Shame and disgrace might well be added to this list.

When the Japanese casualty figures are adjusted to the population of the City of St. Louis, the casualty distribution shown in table 3 is obtained.

Table 3. *Distribution of Casualties*

Target City: St. Louis	Population: 853,000	Area 61 sq. mi.
Total Number of Casualties		285,000
Dead	71,250	
Seriously wounded	35,625	
Slightly wounded	35,625	
Uninjured, welfare casualties	142,500	285,000

These are the casualty figures upon which our plan for the organization of the Medical Service and its tactical employment are based. It has been interesting to see that recently there has been a general trend toward an upward revision of the low estimates of former years.

While, for the reasons stated, no one can predict accurately what the casualty rate in an atomic attack will actually be, we doubt that we will be guilty of having underestimated the problems created by a single bomb attack. If, on the other hand, more than one atomic bomb should be dropped on the City or the County of St. Louis, we will not have to worry about having underestimated the aggressor's blow. There will be no prosecutor or defendant and the judge and jury also will be gone.

In Part III the influence of the characteristic effects of the atomic bomb on the tactical employment of the Medical Battalions will be discussed.

III. The Tactical Employment of the Medical Battalions Following an Atomic Attack

It has been shown in the preceeding part of this discussion that an air-burst detonation of an atomic bomb over a target city like St. Louis has the following effects:

1. It produces a circle of destruction with a diameter of five miles, a circumference of 16 miles and an area of 20 square miles.
2. The primary destruction will take place in from 1 to 2 seconds.
3. There will be 285,000 casualties; the dead will number 71,250; there will be 35,625 seriously wounded and a like number of slightly wounded. In addition there will be 143,500 so called "Welfare Casualties."
4. These casualties will be distributed throughout the disaster circle, decreasing in number and severity from ground zero to the periphery.

The plan of organization of the Medical Service provides that the emergency medical care needed by these victims of the attack will be supplied by the Medical Battalions of the Medical Service. These Medical Battalions will be supplied in part by the Civil Defense Teams of the target city but the majority will come with the Civil Defense Teams from out state and other states, under mutual aid agreements.

In order to accomplish this mission one must answer the following questions:

1. How and where will these Medical Battalions be committed to action and employed?
2. How many Medical Battalions are needed?
3. Who will supply the needed Medical Battalions?

The answer to the first question is given by the demands and needs of the disaster situation: (1) Each sector of disaster circle needs medical service throughout its area. (2) The need is equally urgent in each section. (3) The need for medical service is created in a matter of seconds and medical care must be provided for all sectors at the earliest possible moment. In order to meet these demands it is obvious that the Medical Battalions must approach the disaster circle from all directions and must begin their work as simultaneously as possible. Duplication and overlapping of effort must be avoided and this in turn creates the need for dividing the disaster circle into sectors of equal size so that the Medical Battalions can be assigned to specified areas of action which are numbered clockwise for identification. When the call for action comes the Commander in Chief of the disaster area can determine quickly by means of an overlay the boundaries of each sector and transmit them by radio to the subordinate commanders concerned.

Sectionization of Disaster Circle

In view of the fact that the disaster circle has a circumference of 16 miles, it has been decided to divide the circle into 16 parts or sectors as shown in the diagram. The characteristics of each sector will be as follows:

1. It will have a base line of one mile.
2. It will have the shape of an equilateral triangle.

3. Its height or in this case its depth will measure 2½ miles.

4. Its surface area will approximate 1.2 square miles.

5. If the city has a population density like the City of St. Louis, each sector will contain 18,000 people: dead, 4,500; seriously wounded, 2,250; slightly wounded, 2,250; welfare cases, 9,000.

On the basis of these conditions it is deemed necessary to assign one Medical Battalion for service in each of the sectors. In consequence, sixteen Medical Battalions are needed at any one time to provide medical service to the disaster area as a whole. This conclusion supplies the answer to the second question.

As the next step, consideration must be given

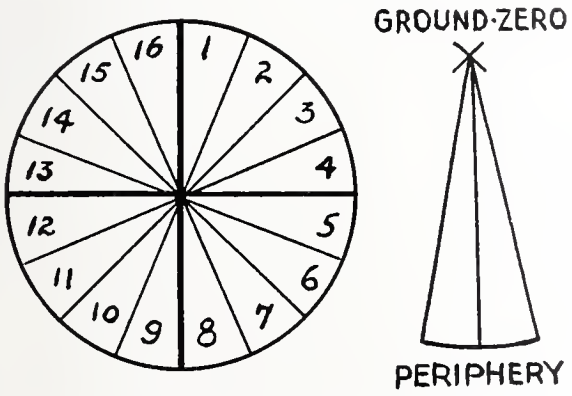


Fig. 14. Sectors of Disaster Circle.

to the fact that the personnel of these battalions cannot function indefinitely and that, in order to maintain their work capacity, the duty asignment must not exceed twelve hours. Inasmuch as it will be impossible to locate, treat and evacuate all the casualties within a given sector in this span of time, it follows that a second group of sixteen Medical Battalions must be provided for the relief of the first group in order to prevent a stoppage in the work. For the purpose of identification, these two groups of Medical Battalions and their associated battalions and the Civil Defense Teams which they comprise have been given a group designation of Corps I and Corps II, respectively.

In appreciation of the possibilty that unforeseen complications may require additional personnel, a reserve corps—Corps III—has been planned. The first two corps and their components will alternate with each other in the disaster area and its sectors. The third Corps will be held in reserve in a designated bivouac and rest area, subject to momentary action on order of the Disaster Area Commander. Rest areas will also be provided for the Corps I and II.

Insofar as the system of supply and equipment of a Medical Battalion is concerned, it is planned that as soon as such a battalion is organized it will be issued for the purpose of training and eventual action, all the items and the quantities as prescribed in its "Table of Equipment." It is the plan at present that each battalion will enter into action with an amount of supplies sufficient for its prescribed work period of twelve hours. Inasmuch as two Medical Battalions will alternate with each other, this arrangement provides for supplies which will suffice for twenty-four hours. If in this time the assigned mission has not been accomplished and the medical and other battalions will have to remain in action, their supplies will be replenished to a moderate extent from State Supply Depots and, on a larger scale, from so-called Regional Supply Depots of the Federal Government.

At this point the reader is reminded that a Medical Battalion is but one of ten battalions which compose the overall disaster unit—a Civil Defense Team. All these battalions will be committed and will serve in the same manner and conditions as the Medical Battalion.

As the Medical and other battalions of a Civil Defense Team enter the assigned disaster sector they will establish their various subordinate units as indicated by the prevailing field conditions. They will work from the periphery towards the apex of the sector. The component units of the Medical Battalion, the collecting, clearing and ambulance company, will establish their respective installations as necessary. They will close, move forward and reopen at new locations as conditions dictate.

Each battalion will be directed by a Battalion Commander. These in turn will be directed by the Commanding Officer of the Civil Defense Team of which they are an integral part. The sixteen Civil Defense Teams will be under the orders of the Disaster Area Commander and he in turn will be under the direction of the State Director of Civil Defense.

This arrangement assures continuity and adequacy of service in each sector of the disaster circle. It assures the orderly accomplishment of the mission of the Medical Battalion, the associate battalions and the parent Civil Defense Team which they compose. It provides the necessary close coordination between the battalions. It defines responsibility; it also defines authority at all levels of the command. The provision for a Reserve Corps assures flexibility and a safeguard against the exigencies of the disaster situation.

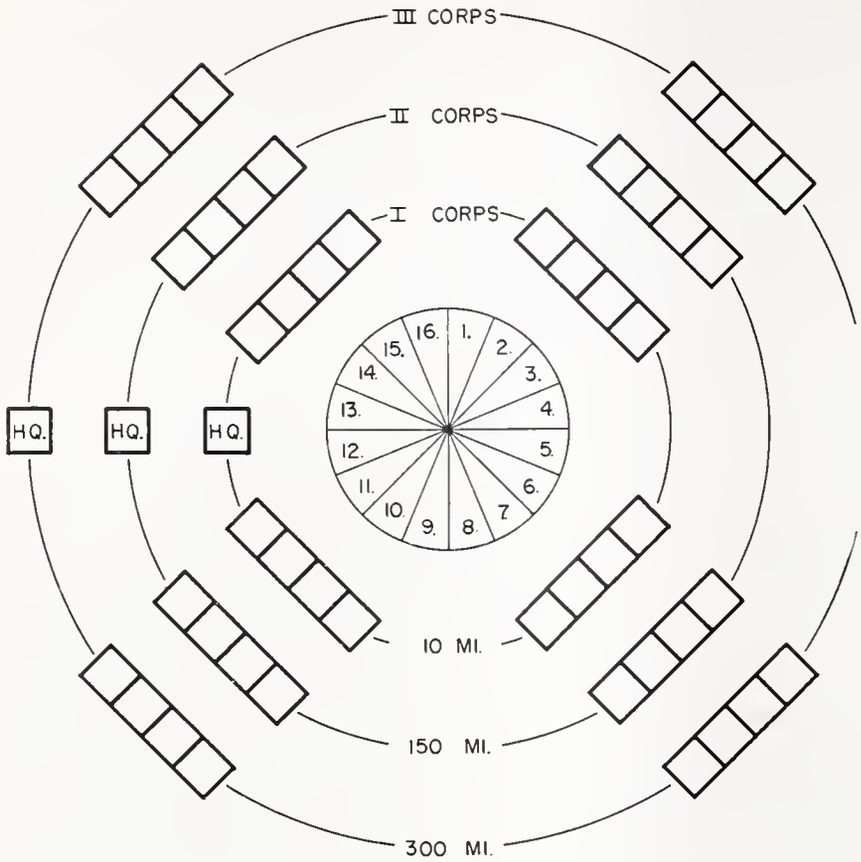
Source of Medical Battalions

The answer to the third question "Who will supply the needed Medical Battalions" is given in figure 15.

Assuming that the attack has been made on the City of St. Louis, it is planned to obtain the first corps of Civil Defense Teams and their medical and other component battalions from the following sources:

St. Louis County	4 Teams
St. Louis City	8 Teams
Adjacent Counties in Missouri and Illinois	4 Teams

In other target cities the sources of the Civil Defense Teams of the respective I Corps will



TEAMS	DIVISIONS	CORPS	SOURCE	DIST.
1ST—4TH	1 ST	I	COUNTY	10 MI.
5TH 8TH	2 ND		CITY	10 MI.
9TH—12TH	3 RD		CITY	10 MI.
13TH—16TH	4TH		ADJACENT COUNTIES	10 MI.
17TH-32ND	5TH-8TH	II	NEAR OUTSTATE	150 MI.
33RD-48TH	9TH-12TH	III	FAR OUTSTATE	300 MI.

LOCAL SUPPLY DEPOTS | STATE SUPPLY DEPOTS | FEDERAL SUPPLY DEPOTS

Fig. 15. Source and employment of Civil Defense Teams and component battalions.

vary in accordance with the plan and the needs of the city concerned.

It is planned to recruit the Civil Defense Teams and their components which comprise Corps II from the area within a radius of one hundred and fifty miles from the target city.

The source for the components of Corps III will be the area within a radius of three hundred miles from the target city.

A few words are in order concerning the mobilization of these units after the bomb has struck. It is the planned procedure that at this time the ranking Civil Defense Officer of the target city will automatically assume command as the Commanding Officer of the Disaster Area. He will make an immediate aerial reconnaissance to determine the extent of the disaster and its Civil Defense requirements. He will transmit this information at once to the State Civil Defense Director who, in accordance with the provisions of the Civil Defense Act, will authorize and direct the immediate mobilization of the Civil Defense Service of the State to the indicated degree.

Scheme of Mobilization

As soon as the order of mobilization is received by the respective Civil Defense Team Commanders in the various parts of the State, they will order their respective commands to mobilize at a specified time and at a designated assembly point in the area concerned, in complete readiness for immediate active service.

When the mobilization of a given Civil Defense Team has been completed its commander will move it by its own inherent transportation to the disaster city along predetermined routes. The movement will be made in convoy and at a speed not exceeding thirty miles per hour.

When this convoy approaches the outskirts of the target city it will be met at a designated checkpoint by a so-called Civil Defense Team Regulating Officer.

This Officer, in accordance with the information about the existing needs in his possession, will direct this and other out-state teams as to their further course of action. Ordinarily, as the local teams are already in action, he will direct the out-state teams to a designated rest or bivouac areas where they will await further orders. At this time, the out-state Civil Defense Teams and all their component battalions will come under the command of the Disaster Area Commander in Chief.

At or about the tenth hour of the work period of Corps I, the teams of Corps II will proceed to their assigned duty sectors of the disaster circle. They will replace their alternate teams gradually with as little interference with the work as possible. When the replacement has been completed, the teams of Corps I will proceed to their assigned

bivouac areas for a rest period awaiting further orders for possible recommittment to action at the expiration of the twelve hour work period of the teams of Corps II.

It will be noted that thanks to this arrangement the commitment of the Civil Defense Teams can be effected in an orderly and timely manner. It is assured that Corps I will be in action within from two to three hours after the attack. The prescribed work period gives sufficient time for the replacement and reserve corps to travel from their points of origin to the target city. There will also be enough time for several hours of rest after the trip before the alternate teams will go into action.

It must be pointed out that the time requirements of this mobilization procedure create a latent period of from two to three hours extending from the moment of the attack until the Civil Defense Teams of Corps I arrive at and begin their functions in the assigned sectors of the disaster circle. In order to overcome this latent period, provision has been made for an auxiliary organization to assume temporarily the duties of the Civil Defense Teams until their arrival.

The Block Warden Units

The creation of block warden units is the responsibility of the Civil Defense Agency of each large city. These local units will be composed of carefully selected citizens who are trained to perform the various duties which a disaster situation demands. These units will function to the best of their ability in the respective blocks in which they reside. During the initial stage of the employment of the Block Warden units, one of their important duties will be the location of the dead and wounded and the administration of first-aid to the latter. This provision rounds out the medical service and assures full coverage from the moment of the explosion until the evacuation of the Disaster Circle has been completed. Upon arrival of the regular Civil Defense Team, the Block Warden units will stop this part of their work and will reinforce the various battalions of the Civil Defense Team which is in action in their particular sector of the Disaster Area. It is believed that Block Warden units will be most helpful as auxiliary police and for this reason they have been placed under the jurisdiction of the police battalion in the scheme of organization of the Civil Defense Teams.

Hospital Service

The formulation of the plan for the organization and function of the hospitals in the target city is the responsibilty of the Civil Defense Agency of the latter. As stated before the depletion of the staffs of these hospitals in the face of their tremendous disaster case load has been overcome by providing for mobile reinforcement groups of physicians and members of the allied profession from out-state areas.

Blood Supply

The need for fresh blood has been covered by the creation of Blood Bank Centers as a part of the Councilor District Medical Organization.

The Mission of a Medical Battalion

As a Medical Battalion enters its assigned disaster sector its mission will be as follows:

1. Locate and register the 4,500 traumatic casualties which are estimated to be present in the assigned disaster sector. (St. Louis example).
2. Provide for the casualties, just sufficient emergency medical care at the collecting points and at the clearing stations, which will prepare them for and will enable them to stand the shock and strain of transportation from the collecting points to the clearing stations in the sector and from there to designated hospitals.
3. Evacuate all casualties from the disaster sector to the place of final disposition,—designated hospitals or, in case of the ambulatory and slightly wounded,—designated billets in the undamaged sections of the target city or in the immediately adjacent territory.

The Objective of a Medical Battalion

Based on the concept that if medical care is to be "adequate, prompt and of good quality" it should reach the disaster victims within twenty-four hours. On this account it is prescribed in the regulations of the medical service that it shall be the objective of the two medical battalions which will serve alternately in a designated disaster sector to accomplish their joint mission within twenty-four hours. This objective is subject to adjustment if it is impossible to recruit medical battalions of the planned strength.

The Personnel Strength of a Medical Battalion

By means of detailed time and motion studies it has been shown that, if the assigned mission is to be accomplished as prescribed, the strength for medical battalions must be of the extent shown in the following summary:

Component Units of Medical Battalion	Officers		Others		Total Strength
	Med.	Adm.	NCO's	Men	
Collecting Company	19	13	82	313	427
Clearing Company	37	8	134	326	505
Ambulance Company	—	7	57	61	125
Headquarters and Headquarters Company	2	5	35	10	52
Total Strength	58	33	308	710	1109

If the Federal Civil Defense Agency decides to include a Surgical Medical Hospital Unit and a decontamination unit in the Standard Civil Defense Medical Battalion, its strength will be in the neighborhood of from 1,250 to 1,500 men.

No figures are available on the proposed strength of the other component battalions of a Civil Defense Team.

In reference to the term "Medical Officers" some comment is in order. This term includes all types of professional men—physicians, dentists, osteopaths—who will participate in the medical care of disaster victims. It will be noted that their number is relatively small. Essentially, it will be their function to direct and supervise laymen who have been trained to give emergency care. It is not deemed feasible to use more professional personnel in this work. Their services will be needed and will be much more valuable in the hospitals and in definitive care.

The Work Capacity of a Medical Battalion

In order to determine whether or not the proposed strength of a medical battalion will be adequate for the accomplishment of its mission and objective, comprehensive time and motion studies have been made. The figures resulting from these studies are as follow:

Type of Casualty	Sector Casualty Load	Casualty processing capacity of: 1 Medical Bn.: 1 Hr.	12 Hrs.	2 Medical Bns.: Working alternately 24 Hrs.
Serious	2,250	93	1,125	2,250
Slight	2,250	94.5	1,125	2,250
Total	4,500	187.5	2,250	4,500

It is apparent that in order to accomplish the medical objective in each disaster sector, it will require two medical battalions working on alternate periods of twelve hours each.

It can be seen readily that a Medical Battalions face a herculanean task in a disaster situation. The case load is large, the time is short and the functions which must be performed are impressive in their complexity.

Functions of a Medical Battalion

The functions of a medical battalion demand varying types of service which are supplied by the component companies of the battalion.

Functions of Collecting Company

a. Establish from 1 to 3 highly mobile Collecting Points as far forward in the assigned disaster sector as possible at locations which afford shelter and which are accessible as needed to the vehicles of the Ambulance Company; in order to keep distance of litter carry to a minimum move these collecting points successively forward when feasible.

b. Locate the wounded in the assigned disaster sector.

c. Administer first aid where patient is found and initiate the Emergency Medical Tag.

d. Evacuate the seriously wounded by litter carry and the slightly and ambulatory wounded by directing them to walk to the nearest one of the established collecting points.

e. Monitor all incoming wounded at the collecting points to determine contamination with radio-active fission particles and dispose of them as prescribed.

f. Segregate dead patients for disposition by Health Service Battalion.

g. Upon arrival of patients at collecting points supplement previous first aid but limit treatment to essentials, sufficient to assure survival of patient during second step of evacuation to clearing station.

h. Load seriously wounded on vehicles of Ambulance Company. Direct slightly, ambulatory wounded to walk to nearest station of Clearing Company.

i. Give spiritual care.

j. Establish and maintain liaison with other units of Medical Battalion and Team Headquarters by means of radio, field telephone or runners.

k. Feed personnel and patients as indicated.

l. Locate or improvise latrine facilities.

m. Establish and maintain water supply.

n. Establish and maintain emergency lighting system.

o. Effect property exchange with vehicles of Ambulance Company.

p. Maintain adequate supplies by replenishment from Clearing Company.

Functions of Clearing Company

a. Establish from 1 to 3 clearing stations in assigned disaster sector at points which afford adequate shelter and space, hard standing for vehicles and good roads.

b. Request Engineering Battalion to establish and maintain water supply and electric lights and power.

c. Request Communication Battalion to establish and maintain radio and telephone contact with Hq. of Civil Defense Team, Corps Headquarters and Hospitals in undamaged part of target city.

d. Locate or establish and maintain latrine facilities for patients and personnel.

e. Receive seriously and slightly wounded from Collecting Points.

f. Triage casualties and separate into following groups:

Type 1 Dead; Type 2 Moribund and surgical emergencies; Type 3 Cases contaminated by radioactive material; Type 4 Cases for routine processing: separate slightly and seriously wounded.

g. Segregate dead for disposal by Health Service Battalion.

h. Transfer Type 2 cases to Surgical Field Hospital (attached) for terminal care and for life or limb saving operations only.

i. Transfer Type 3 cases to Decontamination Unit (attached).

j. Treat all other cases as indicated but limit care to essentials sufficient to assure survival

of patient during third step of evacuation to designated hospitals.

k. Feed patients and personnel.

l. Give spiritual care.

m. Register all patients processed.

n. Notify public information center at General Headquarters of Disaster Command of names of all patients processed.

o. Assign seriously wounded patients through the Regulating Officer to specific hospitals.

p. Load seriously wounded on vehicles of Ambulance Company for transportation to designated general and auxiliary hospitals.

q. Refer slightly wounded (ambulatory) patients to attached Billeting Officer of Welfare Service for assignment and transportation to Billets.

r. Effect property exchange with Ambulance Company.

s. Replenish supplies from designated medical supply depot.

Functions of Ambulance Company

a. If possible operate ambulances ahead of collecting points; pick up seriously wounded after they have received first aid and, by-passing the collecting points, transport them direct to nearest clearing station.

b. If this is not possible, operate ambulance service as follows:

1. Transport seriously wounded patients from Collecting Points to the nearest station of the Clearing Company.

2. Transport seriously wounded patients, after treatment at the Clearing Station, to the General Hospital or auxiliary hospital designated by the Clearing Station's Regulating Officer.

3. Provide transportation for radio-active caualties: (aa) Supply designated "hot" ambulances to transport "hot" casualties (markedly contaminated with radio-active material) directly from collecting points to the nearest decontamination station for decontamination; (bb) Supply ambulances on call to transport decontaminated patients from decontamination station to clearing station for treatment, registry and disposition.

Functions of Other Units of Medical Battalion

Inasmuch as it is problematical at this time whether or not it will be necessary to attach a small surgical field hospital and a decontamination unit to the standard medical battalion, a detailed discussion of their functions is not deemed necessary at present. A brief description of their functions has been given in Part I.

In concluding the discussion on "The Tactical Employment of the medical battalions in an atomic attack" it is deemed essential to emphasize once more that the General Staff of the Medical Service of the Missouri Civil Defense Agency realizes that the plan it has created is an "ideal plan." The philosophical considerations upon which these proposals are based have been presented in Part I. It is believed they are all valid.

The question whether or not there will be sufficient interest and active participation on the part of the public to carry out the plan as proposed must and will be answered by the citizens of this state. It is sincerely hoped that they will be equal to the task. We believe that they will rally to the cause if they are informed of the naked and brutal truth—the fate of the civilian population in the atomic disaster rests in its own hands! There are no short cuts to survival!

CONCLUSION

As the reader approaches the concluding paragraphs of this presentation we expect that he has formulated certain questions for which he would like to have answers. This is not unusual and it is probable that the same questions have been asked at recent Civil Defense conferences. The questions which seem to be uppermost in everyone's mind at the present are:

1. Why has there been so much delay in Civil Defense?

2. Where was the Missouri Civil Defense Service during the recent flood disaster?

3. What is the next step in Civil Defense?

In answer to the first question "Why has there been so much delay in Civil Defense" a differentiation must be made between the planning of Civil Defense and the implementation of the plan into a functioning service. Insofar as the medical plan for Misouri's Civil Defense is concerned, there has been, as a matter of fact, no delay. Actually the plan was finished last fall which was about six months after the request for a plan was made. In view of the large scope and complexity of the requirements this is certainly not an excessive span of time. At any rate the medical plan is the first divisional plan which has been finished and officially accepted by the Director of Civil Defense of Missouri.

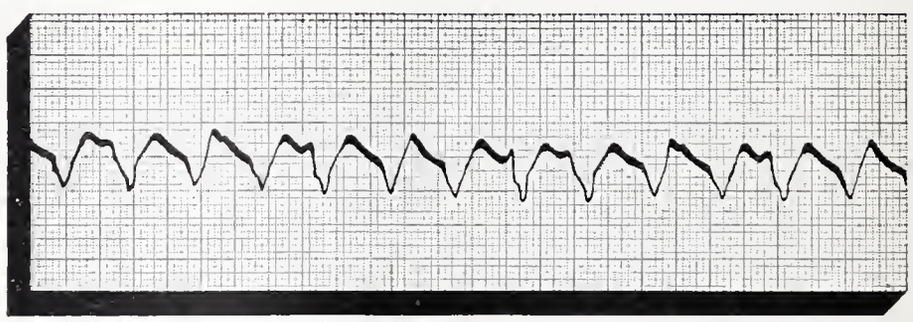
The reason why the plan was not officially accepted until three weeks ago are twofold. In the first place certain administrative principles pertaining to Civil Defense as a whole had to be resolved by the State Civil Defense officials. In the second place those principles could not be defined until the Legislature gave legal authority to Civil Defense and designated the scope of its service and manner of administration. The Civil Defense act was enacted only three months ago. It is certainly not valid to allege undue delay in view of the facts that the Medical Service phase was ready many months before the Civil Defense Act was passed and signed by the Governor of this State.

Insofar as the implementation of the plan into a functioning service is concerned, it stands to reason that this work could not be started until the plan itself was authorized by law. This phase of the work is now before us and is underway.

The second question "Where was the Missouri Civil Defense Service during the flood disaster

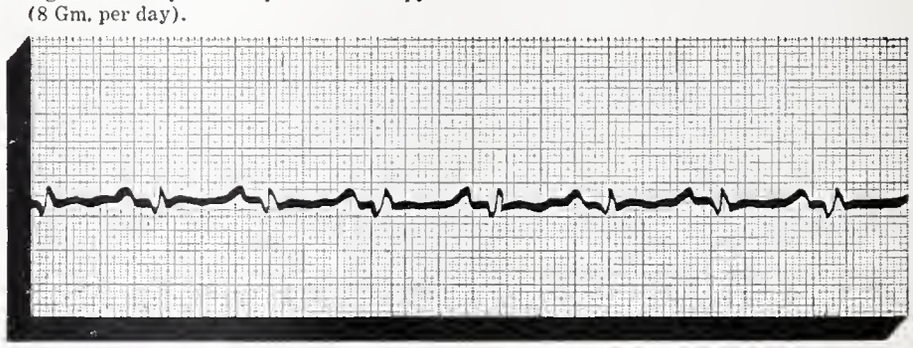
A New Drug..for the treatment of ventricular arrhythmias

BEFORE



Lead II. Ventricular tachycardia persisting after six days of oral quinidine therapy (8 Gm. per day).

AFTER



Lead II. Normal sinus rhythm after oral Pronestyl therapy.

Effective in some patients with ventricular tachycardia who failed to respond to quinidine

PRONESTYL *Hydrochloride*

Squibb Procaine Amide Hydrochloride

SQUIBB

"PRONESTYL" IS A TRADEMARK OF E. R. SQUIBB & SONS

is answered in part by the preceding paragraph. The answer is simply that at the time of the flood a Civil Defense Service as such did not exist. While it had been authorized by the Legislature before the flood, the ink of the statute was hardly dry. In short, there had not been sufficient time to get the immense task of creating an adequate service well under way.

In retrospect of the flood and the tremendous problem it created for existing private disaster relief agencies in the absence of a Civil Defense Service, it is the opinion of the writer that in all probability considerable good may come out of this experience. With due respect to the private agencies which worked in the angry waters and the mud of the Missouri and the Kaw and, giving them full credit for their efforts in a most difficult disaster situation, the plain facts are that private organizations are unable to cope with the exigencies of a major statewide disaster. This is no reflection and certainly is not intended as one on the motivation, organization, efforts and accomplishments of private agencies which dedicate themselves to disaster relief. In disasters of lesser scope they have done outstanding work but in a statewide disaster they lack the organization, the personnel and the physical and financial resources which are essential to cope satisfactorily with such a catastrophe. They have the will and they know the way. They are willing to work day and night to mobilize the needed workers, the supplies and equipment from all over the Country. Unfortunately, all this takes time and in the interim little or nothing is done for the victims of such a debacle.

Captain Hungate, my able associate in Civil Defense planning, was at the scene of the flood. In his constructive analysis of the situation[9] he has pointed out that the greatest weakness of disaster relief by private agencies is the lack of coordination in planning, communications, and in service. As a result it is not surprising that the general end result was poor, too little and too late.

This great Missouri flood teaches the important lesson that major disasters require major remedies. It is clear that the remedy consists of a large, state wide disaster relief organization. This agency must be organized on a permanent, legal and official basis; it must be available at all times at a moments notice and it must be staffed, supplied and equipped so that its whole force will be actually and effectively at work within the hour of the call for help. It must have full authority and control of the work to be done and of those who do the work. This does not mean that private disaster relief agencies should be disbanded. Quite to the contrary they are needed and they can be of great service. However, if duplication of effort and the waste of time and money are to be avoided, such unofficial agencies must be part of the official relief team and under the control of the official quarterback who will direct the defense effort.

Like others, the reader may point out that the suggested official relief team which will serve in such a natural disaster as a flood, earthquake, tornado or other "Acts of God" might well be the Civil Defense Service of the State. While such a plan has merit it cannot be put into effect at present for the reason that the Missouri Civil Defense Act limits Civil Defense to acts of aggressors.

It may well be that the Legislature, in retrospect of the pathetic inadequacies of the relief efforts in the recent flood, may decide to consider the feasability and the advisability of adding the defense against natural disasters to the scope of service of the Misouri Civil Defense Service. There would be ample precedent for such a step as many other states have created Civil Defense Acts of such broad scope. Likewise, the standard Civil Defense Act recommended by the Federal government proposes that the scope of Civil Defense should include natural disasters.

The broader scope of Civil Defense Service recommends itself also because it will stimulate more public support and active participation. Too many people still contend that there is no need for Civil Defense because they feel that an atomic disaster "cannot happen here." They will feel different about Civil Defense if it will be available for service in a natural disaster. They can understand the ravages of a tornado or a flood and it is much more likely that they will participate in a Civil Defense Service which is not limited in its scope.

The answer to the third question "What is the next step in Civil Defense" is rather obvious. The answer is that the time is now at hand to transform the Civil Defense Medical Plan into the Civil Defense Medical Service. This is the task which is the burning issue now. The story you have just read certainly shows the tremendous amount of work which is still before us.

Your colleagues who constitute the General Staff of the Medical Service of the Missouri Civil Defense Agency are ready and willing to continue with the work. It is obvious that these men alone are not equal to this task. We need and must have the help of every physician in this State. Your response will determine the success or failure of our mission.

Remember, in the past the physicians of this State have never failed their obligations to the public. We must not fail them now. Do not forget, regardless of your wishes you are holding cards in this particular game. The stakes are high, the chips are down and the game is rough. It is your turn now to bid—will you play or will you pass?

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PERSONNEL REQUIREMENTS OF THE MEDICAL PORTION OF THE STATE CIVIL DEFENSE PLAN

DURWARD G. HALL, M.D.
SPRINGFIELD

Personnel planning and determination of requirements, as well as actual or individual group assignments, requisite to the proper care of the injured in connection with our State Civil Defense plan necessarily involves:



D. G. HALL

First, approval of and appointment (with proper authority) of key workers in duplicate throughout the entire skeleton organization.

Second, a survey of existing personnel and analysis of their training and abilities.

Third, coordination with the individual plans of municipalities.

Fourth, coordination with adjuvant professions and their assignments.

From personal knowledge of the Governor's approved plan as demonstrated at the Missouri State Medical Association meeting by Dr. Curtis Lohr, who will be Chief of Staff for the medical plan, one notes that the plan is largely similar to the Armed Services in that we are echeloned in strength with reserves in depth. Those who may object to this pleasurism of Armed Forces terms and assignment policies should realize (a) that it is "a workable solution" and (b) that plans are too far along and disasters too close to change the over-all planning even though such critics might have a better solution. It is necessary before actually assigning personnel to specific jobs other than in the topmost responsible positions that authority and funds from the Governor or legislature with perhaps the necessary laws be granted for this specific purpose. To date this has been slow compared with medical preparedness.

It is planned that a questionnaire will be circulated to all physicians in Missouri requesting information concerning availability in the instance of disaster to determine background training, physical fitness and all pertinent information. This will best determine whether an individual should be used locally in a relief batallion, on a medical or surgical team in the disaster area or as an individual replacement. Extreme honesty in compliance with "yardsticks" for measuring special training is obviously required on the part of individuals if this is to be a worth while document on which future lives may depend. Subsequently, such questionnaires will go to members of ancillory professions such as nurses, dentists, aids, optometrists, osteopaths, undertakers, veterinarians.

It is obvious that our entire state must be organized to lend succor and assistance to our great municipalities. In the event of man made disaster for these same obvious reasons, they are appropriately leading in their own Defense plans. We are fortunate in having cities which are eighth and thirty-fourth on our national estimated target lists and even more fortunate in their wise prior planning and able direction before the state plan has been meshed into high gear. Furthermore, any plan designed to render primary assistance to St. Louis and Kansas City may be easily switched by proper use and assignment of personnel to lend relatively greater assistance to smaller areas which might only be secondary targets of opportunity. Therefore, the assignment of personnel and a question in the "medical" questionnaire will have to do with prior local assignments. It will not be difficult to plan and assign personnel so that local municipalities will be interferred with to the least possible extent.

Finally, the medical plans Chief of Staff and his assistant for personnel are anxious for suggestions from organized medicine and look to the State Association for leadership and guidance, and we hope and expect the 100 per cent participation and acceptance of assignment as well as training when such decisions are made. You will hear from us directly as soon as the plan is implemented.

THE FUNCTIONS OF THE GENERAL STAFF SECTION ON PLANS AND TRAINING (D-3)

SAM J. MERENDA, M.D.
ST. LOUIS

At the direction of the Chief of Staff pertinent data concerning the functions of this section of the General Staff of the Medical Service of the State Civil Defense Agency is submitted for the information of the members of the Missouri State Medical Association.



SAM J. MERENDA

This section of the General Staff is one of four components which are: Personnel (D-1), Civil Defense Intelligence (D-2), Plans and Training (D-3) and Supply and Logistics (D-4).

Lt. Colonel, MC, AUS (Ret'd).

The officer in charge of the Plans and Training Section of the Medical Service bears the title Assistant Chief of Staff (D-3). He serves in an assistant capacity to the director of the Medical Service. It is essential that he is active, industrious and well informed in medical functions of a major scope especially under emergency conditions. He must also be a helpful advisor to the chiefs of the subordinate units of the Medical Service. This is a big order.

The need in a military organization or in a quasi-military agency such as Civil Defense for a general staff and its four component sections is so well established that it needs little discussion. The functions of the General Staff are clearly defined in the Staff Officers Field Manual of the United States Army which states that, "The staff secures and furnishes such information as may be required by the commander, prepares the details of his plan, translates his decision and plan into orders, and causes such orders to be transmitted to the subordinate units. It brings to the commander's attention matters which require his action or about which he should be informed, makes a continuous study of the situation, and prepares tentative plans for possible future contingencies for the consideration of the commander. Within the scope of its authority, it supervises the execution of plans and orders and takes such other action as is necessary to carry out the commander's intentions."

The specific duties of the General Staff Section on Plans and Training are manifold and complex, as follows:

A. *General Duties:*
1. The organization and supervision of training of all medical units of the Civil Defense Agency.
2. The planning and supervision of all operations of the Civil Defense Medical Service.
3. Inspection and supervision of all training and operational activities.

B. *Specific Duties:*
1. Preparation and coordination of plans for and supervision of:
   a. Mobilization of medical service.
   b. Organization and equipment of all medical units. (Coordinate with D-1 for personnel; with D-4 for allocation of supplies and equipment).
   c. Training of individuals and component units including:
      1. Preparation of training directives, programs, schedules and orders.
      2. Selection of training sites (Coordinate with D-4 for acquisition of sites and construction).
      3. Organization and operation of training schools.
   d. Disaster operations including:
      1. Continuous situation studies and estimates as affected by the prevailing conditions, instructions from higher C.D. units, actions of neighboring C.D. units, needs for replacements, weather conditions, status of supplies and equipment.
      2. Preparation and authentication of field orders and operation maps required to carry out C.D. plans and their transmission to component units and general staff sections concerned. (Coordinate with D-2 for maps and disaster information; with D-4 for administrative matters.)
      3. Maintain liaison with commanders of component units.
      4. Maintain liaison with neighboring and higher C.D. units.
      5. Supervise personnel movements and operations.
      6. Supervise signal communications.
   e. Recommendation to Commander of the Civil Defense Medical Service of priorities for assignment of personnel and equipment. (Coordinate with D-1 for personnel; with D-4 for allocation of equipment).

I have had the honor of participating in a modest way in the basic planning of the organization of the Medical Service of the State Civil Defense Agency. I am now confronted with the much more difficult job of implementing these plans. It is my sincere intention to render efficient service. Toward this end I request the wholehearted cooperation and support of the members of the Missouri State Medical Association.

FUNCTION OF INTELLIGENCE (G-2) SECTION

WILLIAM J. SHAW, M.D.
FAYETTE

1. THE PRIMARY function of the Civil Defense Intelligence Section is to keep the Civil Defense Director and all others concerned informed regarding the potentialities of the disaster which is expected or has occurred. The section is charged with the planning and preparation of orders and to some extent with operations pertaining to the collection, evaluation, interpretation and distribution of information of the cause of the disaster and with counterintelligence activities.



WM. J. SHAW

A G-2 periodic report will be forwarded to the Civil Defense Director, as requested, giving the following pertinent information at a specified date and hour:

a. The type of disaster which has occurred or

is expected as atomic bomb, flood, fire, invasion.

b. Status of supply and equipment.

c. State of training of civil defense workers.

d. Morale of civilians and civil defense workers.

e. Any change in the disaster since last report.

2. The specific duties of the Intelligence Section may include:

a. Maintenance of contact and exchange of information with intelligence sections of subordinate, higher and neighboring units.

b. Regulation of the activities of newspaper correspondents, photographers, broadcasters, visitors and other persons accompanying or serving with civil defense personnel.

c. Cooperation with the Federal Bureau of Investigation in matters concerning espionage, sabotage and subversive activities.

d. Cooperation with the military services in matters involving their jurisdiction.

e. Regulation of dissemination of information to the public. The public has need for accurate, pertinent information, presented in such a manner that panic is allayed, false rumors and insinuations are combatted and individuals and groups are notified to take positive, appropriate action. The following information should be given general dissemination:

1. The nature of the emergency expected.

2. Measures to be taken by individuals for self protection.

3. Measures to be taken by individuals for group protection.

4. Measures to be taken in general by civil defense officials to provide for the health and medical care of the population.

3. The action taken by the intelligence section of the civil defense medical team will be based on the following assumptions:

a. That conventional high explosives and incendiary weapons may be employed against local communities and strategic installations and resources.

b. That atomic weapons may be employed against highly strategic installations and densely populated areas.

c. That pathogenic bacteria and viruses may be employed as an instrument of war.

d. That toxic chemical agents may be employed as an instrument of war.

e. That the fundamental problem in the event of enemy attack or natural disaster of catastrophic extent is the augmentation of existing medical and public health resources in order to:

1. Care for casualties in numbers that would vastly overload normally existing facilities.

2. Maintain or restore environmental sanitation, or provide temporary safeguards for the purpose of preserving the safety of food, milk and water and preventing the spread of communicable disease following unparalleled damage to normal protective facilities, equipment and services.

Lee Hospital.

SUPPLY AND LOGISTICS

JOHN GROWDON, M.D.
KANSAS CITY

To FUNCTION properly an organization must of necessity be set up in relation to the overall picture.



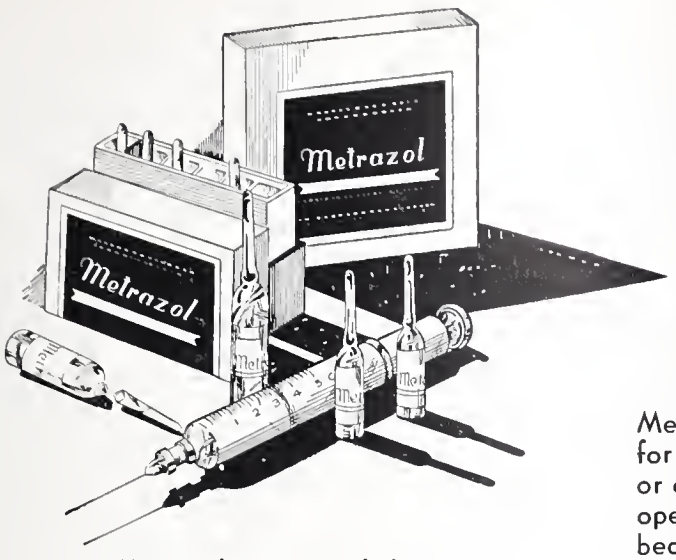
JOHN GROWDON

The question of supplies and logistics in the Civil Defense program of Missouri, therefore, assumes a prominent place. From this branch of the organization is derived all of the detailed planning of requirements for the entire effort. Without the equipment to function properly, its availability when and where it is needed and the storage space to house it, planning is deficient from a functional standpoint. Added to this must be some form of standardization acceptable to all areas of the state.

On this basis it is necessary for the defense organization of Missouri to plan intelligently for any and all needs that might be anticipated. The Medical-Health Division of the State Civil Defense organization will have to make current inventories of the producers and wholesalers of medical supplies and equipment. Large inventories of primary medical aid materials in the hands of retailers should be reported to Regional Medical Directors. Items of special importance are: (a) gauze, bandages, other dressings; (b) antibiotics and morphine; (c) oxygen; (d) stretchers; (e) syringes and needles (hypodermic, surgical, intravenous); (f) sutures. Regional Medical Officers should forward inventories to the Supply Officer. Thus will total needs be adjudged more readily both from urban as well as rural areas. This plan is more important because there is no past experience upon which to base figures in the Atomic Age. The cooperation of all Civil Defense organizations is, therefore, mandatory in this initial planning stage.

If, as a matter of planning, it is assumed that at any street intersection surrounding a blast area 1,800 casualties will occur, certainly supplies sufficient to cover a catastrophe of this nature cannot be stocked at once. However, if every physician carries with him enough material to care for from twenty-five to fifty people, a start will be made and calls can then go out for more supplies from that point on.

The following list of supplies is believed sufficient to take care of the first twenty-five to fifty casualties: five splints, two rolls adhesive, one roll cotton, steripads, 2 and 3 inch bandages, tongue depressors and applicators, syringes, thread, penicillin, adrenalin, morphine, alcohol, jar of vaseline, mechanic waste, hemostats, scis-



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sors and scalpel. These could be carried in any physician's car at all times.

Elaborate supplies for disaster are not necessary. Certainly no definitive treatment should be given at this level.

Hospitals must be stockpiled also and furnished with equipment and supplies to be used in an emergency. Averages should be reported so as to determine area needs. This is especially true of rural areas.

Other supply needs such as blankets, cots, plasma, transportation means, food, water, tents, emergency medical tags, typewriters, police, fire fighters, just to mention a few, must be planned for and be available.

No orders for supplies and equipment should be placed by local communities until cleared with the State Civil Defense Office. Sufficient quantities of materials required for a simple atomic bomb do not presently exist. They must be produced according to specification. Duplication of effort cannot be tolerated.

Federal and state funds will be available for stockpiling. Not only will physicians carry their own small stockpile but target areas will stockpile strategically at the periphery of the city in Supply and Assignment Depots. States will stockpile in rural areas near target centers and there will be regional stockpiles of material for use by several states. Federal money is now available. Matching by states is a requirement to obtain federal funds.

State supply depots will be under the director of the State Division of Health in its Civil Defense role.

Medical officers should emphasize the urgency of feeding the stretcher cases during the first forty-eight hours. Food supply will not be the responsibility of the medical officer, but he must advise that the first responsibility of the food plan must be feeding of the injured. Sufficient balanced stocks of nonperishable foods should be procured and stored in Supply and Assignment Depots in advance. The Army type "C" rations would constitute an adequate balanced supply.

The whole plan for emergency medical assistance will depend upon facilities for transportation of medical and auxiliary personnel, of medical supplies and of the wounded. The most detailed plans for medical transport must be prepared in advance.

Chief Medical Officers in target areas should assume, regardless of legal boundary lines of municipalities, that they are responsible for all transportation for aid posts, clearing stations, supply and assignment depots, emergency hospitals and such.

Chief Medical Officers in outstate areas will be responsible for transport of their medical personnel to an attacked area. This does not mean that they will have, necessarily, a motor pool. It does mean that they will inform the transportation division of the Civil Defense organization, municipal or state, of their requirements.

The Medical Transport Officer of each Chief Medical Officer's staff is responsible for making estimates of medical transport needs and through the Chief Medical Officer inform the Civil Defense Director.

The Chief Medical Officer of the target area must advise the communications officers of his expected requirements for communications with the control center and his field organization. Constant communications should be available during the first four days, especially during the first eighteen hours, so that personnel can be deployed as needed. Communications with the state control center and through it to the state medical battalions should be considered as well as communication with neighboring states.

From these mentioned factors, it is seen that the Department of Supply and Logistics has a tremendous job of planning and needs the help of all departments.

Since we have no basis of past experiences, we must start from scratch in this initial planning stage. With the cooperation of all district and county deputy commanders, the organization of Missouri will end in the final smooth working organization it justly deserves.

1324 Professional Bldg.

THE BLOOD PROGRAM

HOLLIS N. ALLEN, M.D.
ST. LOUIS

ONE HAS to accept the fact that there is no complete substitute in shock, hemorrhage and burns for blood and plasma. Such being the case every pint of blood that can be obtained in case of a disaster may mean one more life saved. It has been estimated that there would be 70,000 living casualties in case an atomic bomb were dropped in the heart of Kansas City or of St. Louis. The larger number of cases would be candidates for blood transfusion. The more severe injuries would need many transfusions if all were to be done for them that is possible. Such amounts are impossible to store and probably impossible to get to the scene in the first twenty-four hours, during which time substitutes would have to be used. The magnitude of the job should be understood and, understanding, measures should be taken to approach the ideal as nearly as possible.



HOLLIS N. ALLEN

It would seem that in case of a disaster in a major city that little could be expected in that city during the first day or so in the way of blood recruitment. People would be so busy in digging out and finding the casualties, and hospitals and other facilities so jammed that there

would be a major interference with procurement of blood.

Such being the case, one of the greatest contributions that could be made by uninjured communities would be the obtaining and delivery of blood.

With this idea in mind it is the plan to organize all possible areas for the most efficient procurement of blood in the quickest possible time.

All hospitals have been contacted and asked to designate a certain person in charge of their blood program. Model plans are being drawn up which will then be sent to these people and each one asked to draw up their own particular plan to fit their particular circumstances.

Many or most of these areas would not have enough equipment on hand to last more than a few hours. Arrangements will have to be made through such agencies as the Red Cross or State Division of Health to stockpile equipment in these areas. Most places are handled by Red Cross at this time and it would not be too difficult to arrange exchange of this equipment so that it would never be outdated or never be a dead loss if, as we hope, it should never be needed.

Personnel from these areas could be trained by the Red Cross or other blood banks, either at the central station or by the mobile unit. These people could then go back and complete the training of their own team. Some point of contact should be maintained on a state level to see that each area is kept up to date and that a shifting personnel, such as is bound to occur, are kept informed and organized.

This personnel should be trained in mass blood typing and proper typing serum be made available. The procurement and stocking of this serum may be an expensive and detailed study, but some arrangement could be made to keep it active as is planned for the donor bottle and sets.

The Missouri Society of Medical Technologists have undertaken a registry of all technicians in the state, whether active or inactive. There are numbers of well trained technicians who because of marriage or for other reasons are no longer active in their profession. To have these people available and registered would go a long way toward solving the technical shortage in such a time.

Thought has been given to typing large groups of people that are congregated in one area. The universities and colleges of the state concentrate in small available groups many thousands of people who would make the best blood donors. If these were pretyped and arrangements made in each locality for the drawing of large quantities of blood, it could be extremely effective. Union organizations have in many instances been cooperative and offer a large pool of available blood. Records of the Red Cross and private blood banks could be gone over and at least the universal donors notified of their type and asked to be available.

It is suggested that immediately after the possible disaster that only blood from type "O" donors be drawn as matching and typing of the patient might be impractical and attention should be paid only to the major typing. More danger would probably come from delay than could be occasioned by reaction from minor groups or high titer universal donors.

Transportation of blood in a refrigerated state from outlying communities may constitute a major poblem and will undoubtedly be taken into the consideration of the proper committee that is dealing with transportation.

It is thought that with the best of planning and most strenuous effort the amount of blood that can be obtained at least in the first forty-eight hours would be highly inadequate. For that reason attention must be directed to the best substitute. Much has been done with three such substitutes namely, gelatin, peristan and dextron. Gelatin seems at the present time to be the most acceptable, but it is thought that within the near future practical substitutes of one or all three may be available. They can be stored in large quantities and be made available instantly and, although no one claims for them all the value of fresh whole blood, they will undoubtedly be life saving in themselves and help to hold many other casualities in good condition until blood is available. It is hoped that this will be taken up and provided on a national scale.

All plans must be kept flexible and every one must be encouraged to use their ingenuity and initiative and what seems an impossible problem may not prove too great after all.

634 N. Grand Blvd.

RADIOLOGIC WARFARE DEFENSE

J. E. SCHIFFMACHER, M.D.
KANSAS CITY

Radiologic defense is defined as the prevention or minimizing of personnel and material damage in the event of an atomic attack.



J. SCHIFFMACHER

Radiologic defense is an integral part of civil defense and as such has essentially the same aims and serves the same purposes. The objectives are to prevent the destruction of the civilian economy and to prevent or alleviate suffering among the people. Confusion, panic and hysteria must be prevented. Radiation hazards to individuals must be discovered promptly and eliminated, and individuals must be prevented from unnecessarily exposing themselves to these hazards. Civil

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Gray, L.: J. Clin. Endocrinol. 3:92 (Feb.) 1943.

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defense workers whose problems require their presence in potentially dangerous areas must be protected in order that their work may continue.

Requisite in radiologic defense is an organization of some magnitude. It has been estimated that in a target city subject to a single atomic bomb explosion approximately seventy-five radiologic monitoring teams would be necessary. These teams, which form the basic working unit of the radiologic defense organization, are composed of a senior monitor, two assistant monitors and of an assistant for each of these individuals. These monitoring groups will serve, in part, as area survey groups designed to cover the entire area in question. In addition, from these monitoring groups will be drawn the service monitoring groups which serve directly with fire fighting, police and health service groups as well as other civil defense organizations. In order that these monitoring groups may be operative, it is necessary that they be supplied with a large number of highly technical instruments requiring considerable maintenance and repair. This necessitates the formation of a carefully selected supply and service organization to augment the functioning of the monitoring groups in a particular portion of the area. Intelligence and plotting groups with headquarters and field units also need to be organized. Suitable coordination of the various sectors brings these groups together under the chief of radiologic defense who serves under the Director of Health Services.

Individuals trained as monitors must be intelligent, readily trained and capable of accepting responsibility, but need not have highly technical experience. Their objective is to obtain statistical data. The evaluation of this data rests with the director of radiologic defense and his advisors. Specially trained medical officers will be expected to function in this capacity.

In addition to this basic framework, there will be a few highly trained technical groups in reserve for monitoring and evaluating particularly complicated problems in radiologic defense.

This entire organization from top to bottom must be integrated with the remainder of the civil defense organization in such a fashion that they function as a unit. Each is essential to the operation of the other. It is readily apparent that a large number of already trained individuals must be obtained, and an even larger number of individuals must be trained and integrated into the organization before it can be termed more than a plan. The entire group must have worked together in simulated attacks before it can be termed an organization. Also it is apparent that the operation of such an organization is limited by the equipment which is placed at its disposal.

In atomic attack, radiation hazards are only a single aspect of the problem. The magnitude of this portion of the problem is dependent largely on the manner in which the attack occurs. In the event of an atomic bombing air, ground and water bursts have been studied carefully in the past and their hazards have been explored. In such an event radiation hazard is of two types: initial radiation and residual radiation. The initial radiation is by far the more intense radiation produced by an atomic bomb explosion. The major portion of this radiation occurs within the first 90 seconds following the detonation. This is a hazard to individuals in direct proportion to the degree of their exposure and to their proximity to the blast. Residual radiation hazard varies with the way in which the bomb is used. In the case of air bursts relatively little residual radiation is to be expected under the best of conditions. With ground bursts somewhat more residual radiation is to be anticipated.

With underwater bursts residual radiation is found in its most potent form. This is due to the trapping of the fission products in the water particles and their ultimate deposition on the ground in the vicinity of the blast or down wind from it, rather than being dispersed for the most part in the atomic cloud, as is the case in the air and ground bursts.

The problem of water contamination in civil defense varies considerably depending upon the locale involved. For inland cities situated on rivers (with which we locally are concerned) the problem is probably minor. In the event of destruction of the municipal water supplies there is, of course, no problem concerning the water from that source. Underground water supplies, such as wells and cisterns, except those in the area subject to the destructive effect of the blast, will probably be unaffected. Municipal water supplies in cities on rivers where the municipal supply and facilities are intact, with adequate filtration, and with other purification equipment should be satisfactory for serving the populus. Any contamination of a river source should be quickly diluted and rapidly dispersed. Contaminated water drawn into the water supply of the city with a modern filtration plant will be adequately decontaminated provided the usual standards are maintained. This problem will be delegated to radiologic defense groups, particularly designated to survey public health problems and particularly trained in this phase of their work.

Food contamination problems also will be the concern of specially designated public health teams for radiologic defense. Food processing plants, slaughter houses, markets and restaurants should be monitored thoroughly and their products inspected carefully before utilization. Food warehouses should be carefully monitored also before disposal of their contents, either by distribution, for use or for destruction as contaminated. Food in essentially undamaged homes, which is in closed containers such as cans, bottles and sealed packages, should be safe for consumption but the container should be cleaned carefully externally before opening, and contamination

of the food during removal should be carefully avoided.

The problem of individual contamination applies both to the individuals evacuated from the target area and to the civil defense personnel working in this area. Radioactive particles clinging to skin or clothing or to other articles may produce a serious menace to health. It is ordinarily to be expected that only a relatively small amount of such material would be found, for example, on the clothing of a contaminated individual. These particles may give off gamma rays, beta particles or alpha particles. Gamma radiation from this source is usually so small as to be of little consequence although its great penetration readily permits it to enter the body. Beta radiation from such a source may provide somewhat more radiation but this is usually dissipated in the clothing or in the outer layers of the skin and in most instances would be unlikely to produce any serious damage. One of the greatest hazards from this type of contamination is the alpha particle. By the transferral of this material to the hands and ultimately to the mouth where it is ingested and subsequently absorbed into the body, the alpha particle, which ordinarily outside the body would produce little or no effect, becomes potentially extremely dangerous. For this reason decontamination stations for monitoring and further measures if necessary must be established along all routes of evacuation.

Safe limits of radiation exposure have been established for a number of years. These, based on a daily exposure, suggest that 0.1 roentgen per day with a maximum of 0.3 roentgens per week is a safe limit of exposure to radiation if an individual is exposed daily throughout his life. It is felt that within these limits no danger of injury to an adult human being exists. To an individual not ordinarily exposed to radiation of this type perhaps 25 to 50 roentgens of total body radiation can be sustained without interfering with the individual's ability to continue with his normal activities.

One hundred roentgens of total body radiation tend to produce some nausea and some change in the blood picture. Many of these individuals would be able to continue with their work, however. In the range of 150 roentgens of total body irradiation in a single day, many of the individuals so exposed would, in all likelihood, be incapacitated, and more than 200 roentgens would in most cases produce complete incapacity. A deliberate effort has been made to arrive at these values for the purposes of evaluating the so-called calculated risk which it is apparent will be encountered in some civilian defense work. It will be necessary for the trained personnel of the radiologic defense staff to evaluate the radiation hazard in certain areas and to define what constitutes the safe area and for how long that area is safe to any one individual. In addition, that individual's total exposure to radiation in that particular area and in any others in which he may have worked must be calculated carefully and evaluated, and maximum doses must not be exceeded. The radiologic evaluation board or the director of radiologic defense must take the responsibility for seeing that civil defense workers are not allowed nor permitted to exceed tolerance doses and workers who have arrived at the limit of exposure must be replaced by other unexposed individuals.

It is readily apparent in surveying the total civil defense organization that the individuals who perform this work must be volunteers serving without pay. The organization is large and the training of the personnel is an enormous task. Equipping this organization with technical instruments is expensive and the further maintenance and repair on such equipment is expensive. Molding this large organization into a functioning unit is a tremendous burden to be placed on the shoulders of the director of radiologic defense, and this individual as well as his assistants will need be far sighted, energetic and persevering, and they will need all of the assistance that we can provide them.

All of the medical profession needs some training in the medical aspects of radiologic defense. We will not be called upon for monitoring but we may all be called upon to evaluate the results of radiation exposure. We have a particular responsibility to the public in medicine, and this is only an additional facet of that responsibility. We need to keep ourselves as well informed as possible on this subject in order that we may help to allay the unfounded fears of the public and adequately care for the casualties of atomic warfare.

700 Professional Bldg.

BIOLOGICAL WARFARE

Civil defense usually is thought of in terms of atomic warfare. Much of the emphasis in civil defense planning has been on preparations to cope with the disaster resulting from atomic bombing of major cities. It is true that if a city is prepared to deal with atomic warfare, it is prepared for anything of a lesser nature in the way of explosives or fire bomb attacks.

But there is one type of attack for which an entirely different kind of civil defense system is needed. That is biological warfare.

Biological warfare variously has been called germ warfare, bacteriological warfare, or—quite often—"bug warfare."

Much printed information about biological warfare has been misleading. One school has said that biological warfare is an absolute weapon which could kill or sicken everyone in the large cities. Going to the opposite extreme, the other school has said that biological warfare is not a practical weapon and that modern medicine is able to cope with it easily and quickly.

As usual, the truth lies between these two extremes. Here are the facts:

1. Biological warfare definitely could be used against the United States.

2. Biological attacks could be made either by enemy military forces or by saboteurs and fifth columnists.

3. Biological warfare could not wipe out whole cities but it could be effective, particularly against special targets.

4. By selecting the proper biological agent, attacks could be made with the express purpose of killing people or of simply making them ill.

This latter course, from the viewpoint of an enemy, might be preferred. Great numbers of sick people would place an intolerable burden on medical and hospital facilities; it would make operation of industrial plants difficult or impossible because of disability of the workers.

It must be stressed that human beings are not the only targets for biological warfare. Equally promising targets would be food, animals or crops.

To the experts, there are three kinds of biological warfare. The first kind, which often has been called germ or bacteriological warfare, consists of attacks with living agents as bacteria and viruses.

The second kind of biological warfare consists of attack with toxin.

The third type of biological warfare consists of attack with special chemicals. Use of these chemicals is restricted to crops.

Certain living agents offer possibilities of great damage to plants, too. Some of these are insects, others are various plant diseases. All are aware of the damage done within the United States by such accidental foreign imports as the Japanese beetle, the Mediterranean fruit fly and the European corn borer. Many other such plant plagues scattered throughout the world could cause untold damage if introduced into the United States. Most of them could be eradicated, but only at great expense.

These, in brief, are the facts of biological warfare.

Another item of some interest is the recent series of reports published by Communist propagandists in Europe of alleged biological warfare on the European potato crop by America. According to these reports, American planes introduced potato bugs into the potato crops. The stories, of course, are sheer nonsense. Still, the reports are food for thought. Is it possible that the Communists, using their typical method of operation, already are preparing their excuse for the day when they might use biological warfare against us?

It is obvious that plant diseases and plant pests could be sown within the United States easily by saboteurs. But how could biological warfare attacks be made on people or on animals?

There are many possibilities. Some animal diseases are extremely infectious and, once planted, would be difficult to control. Farmers are much aware of the possibilities of hoof and mouth disease, rinder-pest, newcastle disease and others. A few infected animals in a shipping center could carry these diseases to many parts of the country within a short space of time. Many ranges are wide open and it would not be difficult for infected feed or something similar to be dropped from private commercial aircraft operated by saboteurs.

In attacking people with biological warfare agents, it would be possible to contaminate food and water supplies with toxins. However, for practical reason this could not be done on a wide scale and targets probably would be persons in a rather restricted area. A saboteur, for example, could accomplish a great deal by infecting the food or water supply of a critical industrial plant such as a factory making machine tools. Certainly toolmakers would be desirable biological warfare targets—to mention just one possibility.

One method of attack not mentioned is the use of aerosols. A few years ago the word "aerosol" belonged exclusively to the technicians. With the development of aerosol bombs, such as those used to spread DDT, it came into general use. Even before the development of spray bombs, small scale aerosols were in everyday use. Insect sprays, the hand operated kind, create small scale aerosols. So do bathroom atomizers. The logical development is to create large scale aerosols for the express purpose of spreading germs.

These large scale aerosols do exist. Some of the smoke screens laid down in the last war were, in fact, large scale aerosols. To use them in biological warfare, it is only necessary to float within the tiny droplets the biological agents which one wishes to use.

This aerosol attack method offers unpleasant possibilities. An enemy submarine surfaced off shore, for example, might be able—if weather conditions were favorable—to float an aerosol mist over one of the coastal cities. Aircraft could launch aerosols much as they now launch DDT sprays over crops, or they might drop aerosol containers.

The use of small scale aerosols also offers possibilities. A typical mosquito bomb containing, not an insecticide, but an infective aerosol, might be used at the air conditioning intake of a critical industrial plant or of an office building in which key personnel were gathered. A simple hand operated insect spray might serve the same purpose. There are many possibilities in biological warfare. The question is, what does Civil Defense intend to do about them?

The United States is particularly fortunate because the basic system of defense already is in place. All have seen it operate. For instance, this is one of the comparatively few countries of the world in which one can drink water right out of the kitchen tap. One is able to do so because of a health system that insists on water supply purity

and takes all precautions to safeguard the health of citizens. Water borne diseases in the United States are extremely rare.

In driving from state to state, one is stopped at plant quarantine stations where one is asked if he is carrying any plants, fruits or any green growing thing. Such quarantine stations are set up to prevent spread of plant diseases.

Every person entering this country must go through quarantine procedures to be sure they are not carrying infectious diseases.

If this system should break down, another phase goes into operation. Not long ago a man with smallpox traveled up the eastern seaboard into New York City. A couple of decades ago such an incident could have resulted in a smallpox epidemic. But today the health system is ready for such emergencies. Literally millions of people were vaccinated for smallpox as soon as the case was discovered and only twelve other cases of smallpox resulted.

The purple stamps on meat and, on milk bottles, the word "pasteurized" or "inspected" are evidence of a health system at work.

In many principal cities, signs on restaurants show that the restaurant has been inspected and is safe.

Obviously, the system is in place. It requires strengthening and it will be strengthened to meet the threat of biological warfare. Civil Defense at the federal, state and local levels is cooperating with the existing health system. Instructions are being sent out to state and local health officers, to agricultural extension service county agents and to various plant research stations. The entire system is being alerted to the possibilities of biological warfare.

It might not always be possible to know when a biological attack had taken place. The first evidence might be a number of persons ill. For this reason, the system of reporting diseases is being strengthened. A careful watch will be kept on absenteeism of workers from industrial plants since that might be the first evidence of a biological warfare attack. Similarly, schools will be watched carefully for signs that an unusual number of children have been reported ill.

Crop and livestock growers are being asked to report anything of an unusual nature in their flocks, herds or crops. They will report to their agricultural agents or to their civil defense directors.

But the discovery that a biological attack had been made would be only the beginning. It would then be necessary to determine the nature of the attacks. The time required for such identification would vary according to the type of agent used. It might take only twenty-four hours or it might take as much as two weeks.

Once the nature of the agent had been determined, the Civil Defense authorities would know what steps were required. In the case of biological warfare against humans, these steps might be mass inoculation or vaccination. Quarantine might be required in the case of diseases of an infectious nature. In some cases, although probably not the majority, decontamination by special civil defense squads might be necessary.

In the case of biological warfare against animals, as every farmer knows, heroic measures might be required. Biological attack with hoof and mouth disease, for instance, might mean that infected animals would have to be slaughtered in order to prevent the disease from spreading. Similarly, in the case of biological attack on plants, destruction of infected crops might be necessary.

There is no doubt but that some of the steps necessary to combat a biological attack would work hardship upon the individual. However, there also is no doubt but that the American people would accept this hardship for the common good. This has been the tradition in the past. It must be the tradition in the future.

Although the burden of defense against biological attack necessarily falls on specialized personnel, particularly on the medical and agricultural professions, there is much that the individual citizen can do. It may seem like belaboring the obvious to state that the first duty of the citizen in regard to biological warfare is to stay healthy. It may also seem a little strange to request that the citizen stay healthy in the face of a weapon that is designed to make him do exactly the opposite. The higher the individual's health level, the greater his individual chances of throwing off a biological attack. Or, if he does come down with the disease which has been used, the greater the chances for his recovery.

A program of neighborhood cleanliness is in order. The empty lots with their accumulated trash should be cleaned up, and alleyways kept clean. Garbage and refuse should be kept in covered containers. To see that this is done is the duty of every citizen in a neighborhood.

What would the total effect of such a neighborhood cleanliness program be? In the case of attack with aerosol, it would not help to prevent initial illness in those persons directly exposed to the aerosols but it would reduce the number of secondary cases. It should be added that even direct exposure to aerosols would not mean that every person would be come a victim.

It is true that epidemics following biological attacks are not likely in any case. Neighborhood cleanliness programs would make them even more unlikely. This would mean that the victims of a biological warfare attack would be those reached directly by the aerosols or other attack methods.

One of the things most important is to take the mystery out of biological warfare. It must be reemphasized time and time again to the point of boredom that biological warfare is not a supersecret weapon capable of wiping out whole cities or while areas. It must be emphasized that the use of biological warfare does not even mean that

all persons directly exposed would die or be subject to some crippling aftermath of the disease.

But at the same time we must continue to emphasize what is true: that biological warfare is dangerous. It could hurt. But it could not hurt critically if one is prepared to meet it.

As in the case of atomic or conventional warfare there is no absolute defense against biological warfare. If an enemy should make an attack, he probably would be successful in delivering biological agents to the target. Whether or not he would be successful in achieving his purpose would depend on our readiness to meet the attack. It would depend on the alertness of citizens and civil defense corps.

If we are alert, and if we are prepared, biological attack can be recognized, the agent identified and counter measures taken promptly. These counter measures can be effective. But they can be only as effective as our interest and effort have made them.

From the National Civil Defense Administration.

PUBLIC HEALTH ACTIVITIES IN CIVIL DEFENSE

CHARLES F. BLANKENSHIP, M.D.
KANSAS CITY

PUBLIC HEALTH has been defined as "the art and science of preventing disease, prolonging life and promoting physical and mental efficiency through organized community effort." (C.—E. A. Winslow). It is hoped that any reader will pause at this point to digest and fully understand the implication of the clause "through organized community effort."



C. F. BLANKENSHIP

What then should the communities of Missouri or of other states expect of their public health organizations—if they have such organizations, For what activities should communities organize their efforts in an attempt to prevent, or minimize, death, injury or illness resulting from an enemy attack on civilians? Physicians of Missouri should know the preparations that are being made by the thinly scattered health forces; physicians should participate in the discussions of what needs to be done and what can be done reasonably; physicians should prepare themselves to help in whatever activities are attempted. No community can perform adequately any public health activity without the support of the medical profession.

Lest we underestimate the dimensions of the civil defense program and the implications of our present situation, let us set the stage properly for our further acts and considerations:

Regional Medical Director, U. S. Public Health Service.

First, there is too much tendency to depend on the federal government to do this job. The federal government, through the Civil Defense Administration and other governmental agencies, will do everything in its power to furnish leadership and guidance, to provide information and advice, to establish training methods and to construct from individual state and local efforts an effective nation-wide civil defense program. But the federal government cannot and should not assume the responsibility of the community to protect its own citizens. State and local effort comprise the real substance of the civil defense program.

Second, the United States can be attacked, and attacked successfully, by our enemies at any time. Even after we extend our air defense system 70 per cent or more of an attacking air force would get through to its target.

Third, such an attack could be made at any time, with little or no warning. If the attack came today—and it could—we would have perhaps only one or two minutes warning. As our radar and warning systems are developed, this period may be extended to as much as one hour.

Fourth, the attack could be with any one or several methods simultaneously. Atomic bombs undoubtedly are, in the minds of the public, the greatest danger and the most frightful to contemplate. However, many informed persons believe than any overt attack may be by several weapons: atomic or radiologic, high explosive, incendiary, chemical and bacteriologic. From the viewpoint of the enemy, would it not be advantageous to have large numbers of workers and living casualties become sick from a devastating communicable disease a few days after an atomic bomb attack? Properly planned, and we have no monopoly on knowledge in the field of biological warfare, such mixed attacks would have a decided synergetic effect in destroying human life, producing casualties and in disrupting the economic, social and productive capacity of a city. It is likely, also, that a determined and resourceful enemy would open a period of attack by the covert use of bacteriologic warfare, taking advantage of the incubation period of the disease or diseases chosen and the difficulty of determining with certainty that the disease was the result of enemy action. The attack could be against humans, animal life or agricultural products, or all three.

To summarize these points, enemy attack, in force, by one or more of these methods, could be made at any time with little warning; we could not stop it; and tens of thousands, or millions, of American civilians would die, or be injured, or get sick as a result of it.

What then are the responsibilities of the health services, assisted by the physicians, other professional people and the citizens themselves, in preparing to cope with our critical situation?

Civil defense has, as a matter of fact, only two

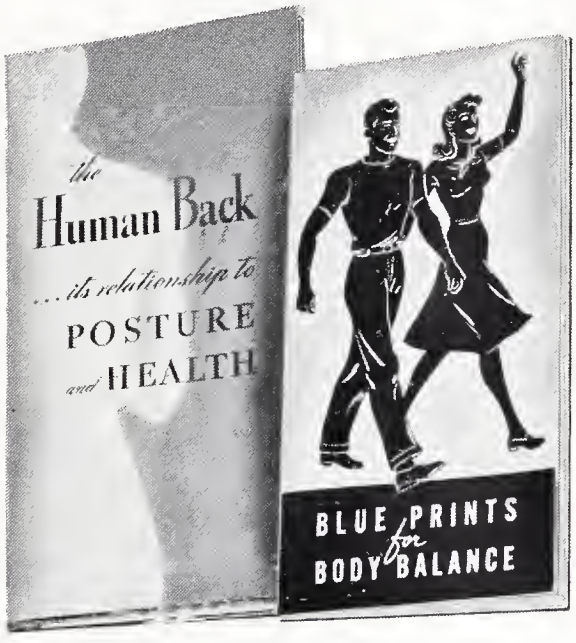
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objectives: to protect the public health and to protect property. Any action taken by the nation, state or community to protect the public health could logically and does come within the scope of "Public Health Activities in Civil Defense." Due, however, to the organization of the series of papers of which this is one, this paper will not cover the details of the subjects of casualty service and hospitalization. The organized medical professions have demonstrated commendable foresight, initiative and leadership in some communities in developing plans, in perfecting organization and in training for mass casualty and hospital services in civil defense. Other communities have not, to date, been so fortunate as to discover such leadership among their own professional personnel.

Within the definition of public health given at the first of this paper and in the minds of the public, any community health organization that fails to organize such casualty and hospital plans for civil defense, if the medical professions do not take the leadership in it, is being derelict in its duties. Organizing the community for health defense, whether against enemy induced or naturally occurring disease or injury, is the purpose for which the citizens form health organizations; it is what they expect of their health officer; it is the reason they authorize the expenditure of tax funds.

Exclusive of casualty and hospital services, the functions and duties of public health agencies in civil defense have been classified by the Federal Civil Defense Administration[1] under three main headings: (1) health supplies; (2) special weapons defense; and (3) public health services. It is important that the physician reader note that: (a) these are all functions recognized generally, or in some communities, as normal functions of health agencies; (b) these activities in civil defense will differ from peace time activities generally only in magnitude; (c) each activity depends for success on the active support and participation of the medical profession. Until physicians become part of planning, organization and execution of the public health activities, they will fall far short of full effectiveness. In all three classes of activities the plans must contemplate enemy action by atomic, radiologic, high explosive, incendiary, chemical or bacteriologic agents.

Health Supplies.—In preparing for enemy attack on civilians it is necessary to inventory and maintain a current inventory of local health and medical supplies, to arrange through civil defense machinery for the procurement of additional supplies from supply sources or undamaged areas and to plan for the procurement of federal supplies, if such become available.

This function becomes an enormous undertaking when one contemplates a disaster of the magnitude of an atomic or several atomic explosions. The health agency and health officer needs urgently the assistance of physicians, pharmacists, drug, biological and surgical supply representatives and others in planning and carrying out this function.

Special Weapons Defense.—Included in this classification are activities of health agencies to prevent or minimize casualties resulting from radiologic, bacteriologic or chemical attack against civilians.

The jobs in radiologic defense would include the detection of attack if it were made covertly, the evaluation of the type and extent of the attack and action to minimize the effects of the attack through decontamination, elimination of dangerously contaminated food or water supplies and advice to the medical profession as to the severity of exposure so that prognoses and treatment for mass groups could be determined intelligently.

By no means do health agencies claim a monopoly in the field of radiologic knowledge. Other agencies and professions have special competencies and personnel that are vital to the radiologic defense program. It is essential, however, that the physicians, sanitary engineers, bacteriologists and others in health agencies be included in the radiologic defense team. This appears to be highly desirable since already a good number of these persons in health departments have been trained for the work, and the number will increase materially. A workable and successful plan of mutual aid between local, state and federal health agencies has been in use for many years and no other public agency is better prepared to work with physicians in the field.

The greatest opportunity for an enemy to attack civilians by sabotage probably exists in the field of bacteriologic or chemical warfare although, as pointed out previously, these methods could and probably will be used in conjunction with others in open, overt attack.

Biological or chemical attack could be done by contamination of water, food supplies or air. Biological attacks could use a large number of pathogenic agents while many chemicals would be effective. Prominent among the latter are the nerve gases.

Health agencies at all levels work closely with other public officials in the protection of public water, milk and food supplies or actually operate these programs as a part of health department functions. Since there is no essential difference in excluding, detecting, identifying or eliminating pathogenic material in water, food or milk, whether its introduction be by enemy agents or not, the health agencies are planning and sharpening their efforts in this field with civil defense against enemy induced contamination in mind.

The dissemination of bacteriologic or chemical agents into the air, in such a manner as to cause considerable illness or death among civilians, is entirely feasible. While self perpetuating epidemics probably could not occur, considering the high level of diagnostic ability of the medical

profession and the efficiency of present health protection machinery, serious outbreaks of communicable disease probably could be accomplished in cities, parts of cities or among persons assembled in groups, by air contamination.

Possible air contamination demands an activity that is practically new in the experience of health agencies. If such bacteriologic agents can be introduced, it would be imperative that they be detected, isolated and identified as rapidly as possible. Considerable research has been developed and is progressing in the collection, isolation and identification of such agents from the air and programs resulting from this research have started on a significant scale.

It might well be, however, that the practicing physicians, seeing patients in their routine practice, will be the first to see evidence of an attack by biological methods. It is imperative, therefore, that the communicable disease and epidemic reporting machinery of states and the country be improved and sharpened. While one or a few cases of a particular disease seen by one physician would not be of particular significance to him, too much importance cannot be placed on the urgency of prompt reporting of all infectious disease so that health authorities may note unusual occurrences either as to seasonal incidence, age, race, occupation or other population incidence, and strange reaction or lack of it to established therapy. If communicable disease occurs in unusual numbers, at peculiar times, among unfamiliar groups; if it is an unusual disease entity with previously unnoted resistance, all of us, public health workers and private physicians, must be suspicious of enemy induced disease. Only through prompt and complete reporting can such attacks be detected early and minimized.

Some communities have already felt that it is desirable, and have actually accomplished, the mass immunization of their people against some infectious diseases. The advice and active participation of physicians in this program too is essential.

Public Health Services.—For purposes of this paper "public health services" includes those activities carried out every day by health departments and which will still be necessary during a period of war whether we are attacked overtly or covertly by any method.

Ordinary communicable disease control, elimination of industrial hazards, collection and analysis of morbidity and mortality statistics, supervision of food and milk production and distribution, protection of the health of mothers and children, proper sewage disposal, the provision of laboratory services, disposal of the dead in a safe manner, mental hygiene, dental hygiene—none of these fields will cease to be a problem with the advent of war. In fact, many of them will be intensified and health agencies need to be prepared to carry them on as before and to secure indicated additional assistance from physicians and trained lay workers.

In all activities enumerated in this paper, health agencies need to plan the changes and expansions needed for civil defense; they need to perfect the organization to perform the civil defense functions and they need to train the personnel, professional and lay, to perform the duties.

Excellent progress has been made in some communities. Others have done something and many, even sizeable cities, have done almost nothing in planning, organizing and training. Although country wide the attitude of the people, as reflected through their appropriating and legislative bodies, might be called apathetic, a great deal can be done with available resources and reasonable amounts of funds.

Every physician will be needed—he is needed now—to help in the health aspects of civil defense whether his community is an expected target area, one designated as a mutual aid community or one from which professional and other services are needed in mobile support. While planning and organizing for casualty and hospital services in the more spectacular calamity resulting from an atomic explosion, the physician will be essential to the less understood activities classified in this paper as health supplies, special weapons defense and public health services. Lack of attention to these fields might be as disastrous as to ignore the planning of casualty and hospital services.

Sound public health programs have been supported always by the medical profession and the record made by physicians in helping their fellow citizens in time of emergency is equalled by no other group—whether it be an individual or family emergency, a community disaster or a national emergency. It is believed confidently that in the present emergency physicians will contribute their intelligence, their special knowledges, their energies and their time to the end that the maximum degree of health and the minimum amount of sickness, injury or death will result for the people of America.

911 Walnut St.

1. "Health Services and Special Weapons Defense," United States Civil Defense, Government Printing Office, Washington. D. C.

SERIOUS VIRUS INFECTION TRANSMITTED BY DOPE ADDICTS

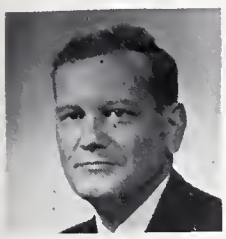
The transmission of a serious virus inflammation of the liver as a result of the communal use of hypodermic needles by dope addicts was reported in the Sept. 15 *Journal of the American Medical Association.*

This additional hazard of dope addiction was reported by Drs. Emanuel Appelbaum and Mennasch Kalkstein, New York City, after studying the case histories of nine heroin addicts suffering from viral hepatitis, each of whom had received intravenous injections of the drug.

MEDICAL PLANS FOR CIVIL DEFENSE IN A NONTARGET AREA

S. A. GRANTHAM, M.D.
JOPLIN

A NONTARGET AREA is considered to be one of relative military immunity. However, if the enemy were aware of such unprotected spots, attack would obviously be invited. Possibly too much stress has been placed on the strategic importance of industrial and population concentration as exemplified by the obscure geography of such militarily important points as Yarvik and Narvik, which disastrously confused the British high navy command early in World War II, to the present important distinction between Yonchon and Chorwon (which is thirteen miles away).



S. A. GRANTHAM

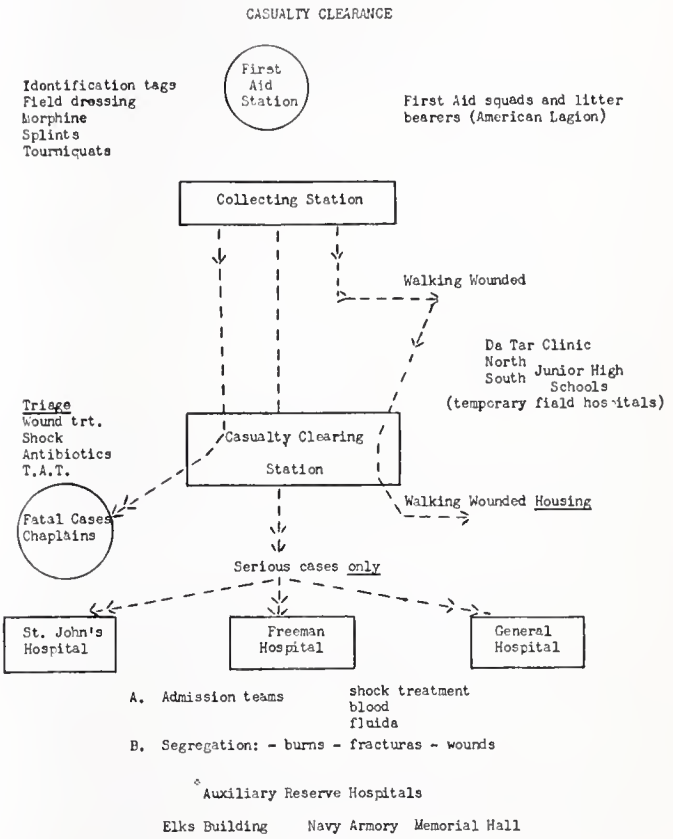
Furthermore, defense thinking has been crippled in some nontarget areas by the local assumption that the cities, in their competition for rating as target areas, have been effective in directing priority on enemy schedules for the A bomb. The world is full of small towns, most of which are on crossroads, each of which extends in two directions suitable for air borne armored motor vehicles and the establishment of invasion or resistance points involving Metropolis.

Therefore, any nontarget area obviously has two main functions: (1) its own defense, and (2) obligation to the nearest large community. The following casualty clearance schedule has been adopted for Joplin and may be changed in any way to fit local needs. The use of school buildings as available emergency hospitals has been highly recommended by authorities.

The most important function of a nontarget area is the readiness of a mobile unit to go into the target zone as an auxiliary to the existing medical forces, i.e., mobile support. Dr. Curtis Lohr has clarified this in his concept of First, Second and Third Corps units. For instance, Joplin might be considered Second Corps for Kansas City—doctors, nurses, technicians and rescue teams to report as a group to pools or bivouac areas on the outskirts of Kansas City for reassignment as individuals. For St. Louis, Joplin might be considered as Third Corps, to go in there as relief personnel in the less immediate phase.

What has been done and what needs to be done? We have tried to set up a tentative plan in the simplest, most concrete form, bearing in mind Dr. Ralph Duncan's remark that any plan is better than none. It is my belief that only with actual training and repeated drills can the matter gain true form and substance. It is difficult for most minds, for instance, to take "abandon ship" drills seriously unless they are under military compulsion. This is seen in the difference in attitude between passengers and ship's company (officers and crew, all levels and echelons) when drill alarms are sounded at sea. Even in hostile waters full of rocks and shoals the levity and irresponsibility of civilian passengers is incredible.

The following necessary organizational details have not been worked out. The inventory of medical and surgical supplies is inadequate. No



depot or stockpile of supplies is on hand. The rescue teams to be furnished by the American Legion have had little training. Auxiliary ambulance units have not been designated or trained. An alert status has not been practiced. The City Health Department and City Council have not discussed civil defense.

The following measures have been started, due largely to the initiative and responsibility of the individuals concerned. Local facilities will predetermine the extent to which towns similar to Joplin may profit by our experience in this formative survey phase.

Education and Public Support.—Dr. Carrol Hungate's Navy Atomic Exhibition was seen by a large and interested audience. The local press has been cooperative in publicizing matters of public interest. Numerous presentations of civil defense have been made to interested groups.

Hospital Inventory and Expansion.—Expansion of existing hospital bed space has been reported by Mr. Harry Keller, Superintendent of Freeman Hospital, who is making a survey for placement of patients in Joplin.

First Aid Training.—Courses for 5,000 trainees are now in progress according to Miss Mae Talbot, Red Cross Director, although only 500 now hold certificates.

Blood Bank.—Approximately 1,200 donors have been typed and registered, according to Dr. Ralph Ferguson, pathologist at St. John's Hospital. Dr. Ferguson is at present engaged in a study of plasma substitutes at the Missouri State Hospital for Tuberculosis at Mt. Vernon, which ties in with the Councillor District plan and should prove of great value.

Plant Protection, Radiologic and Biological Warfare.—Mr. Irving Roth, a consulting chemical engineer with experience in atomic plant and arsenal protective measures, has accumulated a library of pertinent information.

Nurses, Nurses' Aids and Practical Nurses.—An active and up-to-date inventory of available nurses is kept by Miss Lois Hammond, R.N., and Miss Virginia Patterson, R.N., surgical supervisors and nurse superintendents at St. John's and Freeman hospitals, respectively.

Civil Defense has an unpopular aspect to it, particularly from the viewpoint of politicians, since it makes some people uneasy and uncomfortable to consider danger, distress and disaster. No one wants to be a scarecrow and many people call our dangers hypothetical. The unmilitary civilian doctor must see the reason for adequate civil defense as well as the hardened veteran who finds all this pother vaporous in comparison to his acute bloody experience. It is my conclusion that civil defense merits the serious consideration and participation of all doctors, for only in all-out preparation can there be any comfort against the devastation of an all-out attack.

420 Byers Ave.

MEDICAL PUBLIC INFORMATION

J. DALE BENNETT, M.D.
KANSAS CITY

The need for informing the public concerning the necessity for an adequate civil defense structure is a vital one. The role of "health education" is a continuing one beginning with the inception of planning until the health needs of the stricken community and its casualties are fully met. The physician is concerned with giving proper information as to the medical aspects of the predisaster propaganda program so that individuals will be prepared for any catastrophe that may come. Public health information is concerned that all propaganda concerning the medical aspects of the atom bomb will be prepared in such a way that hysteria and panic will not be created on the one hand or complacency on the other. The methods by which this information can most effectively be distributed to every person in the United States are many in number.



J. DALE BENNETT

Public health education must reach all groups who have an interest in the health aspects of an atomic catastrophe. The general public must be propagandized so that they develop certain reaction patterns which minimize casualty effects. Public health education must reach certain organizations so that thousands of lay volunteers may be recruited and trained as an auxiliary military force. Public health education also can contribute toward the recruitment and training of other specialized civil defense service.

In a general way, civil defense and the risk of an atomic attack have been fairly well publicized at this time. If everyone cooperates and does his share individually they will be much better able to withstand any emotional crisis which might arise during an attack. The public should know that doctors, nurses and allied groups are prepared to handle medically any catastrophe which arises.

The timing of propaganda should be such that maximum results are produced. When recruits for various units are needed, the propaganda should be timed so that when volunteers offer their services they can be utilized at once. The press and radio must cooperate closely in such a program.

To produce maximum effectiveness of public health propaganda, the radio, newspapers, television, exhibits, motion picture trailers and printed materials should be utilized to their fullest extent.

After an attack, public health propaganda will again play a major role in allaying confusion and panic. Preparations must be made in this postattack period to broadcast for blood donors whose services will be greatly needed in the postdisaster stage.

As physicians, both in urban and rural areas, we have a great opportunity to be of public service and, in addition, to further enhance favorably our relations with the general public. At the present stage the public thinks of defense against atomic weapons only in terms of disaster planning and therefore look to physicians for advice. This presents us with an unusual opportunity to instill interest into the people. Before we can discuss the problem intelligently it behooves us to acquaint ourselves with the need for and the problems of civil defense. The physician in the larger city is able to see the need for civil defense more clearly because of his relative proximity to the danger. The physician in the rural area may see the need more dimly because of his relative immunity from disaster; however, the rural physician must see that when the larger cities have suffered disaster it becomes the responsibility of the smaller communities to come to the rescue.

As the national campaign to promote civil defense gets under way and people become more

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aware of the need, there will be more requests from lay groups for speakers on the subject. It has been the experience of one large city in the state that physicians have of necessity filled a large part of speaking engagements. The public quite naturally looks to the physician as most qualified, whether it be true or not. As public interest becomes aroused, a few words to a patient in the office will surpass in value much that is written in the newspaper or broadcast on the radio.

The national publicity program will be implemented by means of the radio network and the newspapers but it nevertheless remains the responsibility of a few local individuals in any area to crystallize the thinking and actions of the people so that effective action can be taken. These local individuals are most likely to be physicians.

In the past physicians have not been willing to express themselves in public service except in a professional way because of their heavy professional obligations. We have learned in the last few years that we are not held in high esteem as a group by the public. This is because of our reticence to exert our leadership in the community. The profession has a great opportunity to elevate our position in the eyes of the people and to do a great service to the country by taking the lead in publicizing our need for civil defense.

England was saved in the last war because of five years of preparation for home defense whereas Germany and Japan made no preparation. We must prove to our enemies that a free country can do the job.

1630 Professional Bldg.

TIME FOR A DECISION

CARROLL P. HUNGATE, M.D.
KANSAS CITY

After two years of the most thorough education of the Midwest in the matter of disaster and civil defense, particularly Missouri and Eastern Kansas, it appears that we must begin all over again and restate the basic principles, functions and organization of Disaster and Civil Defense Organizations.

The Hopley Report was the original blueprint for Civil Defense planning. The late Russell J. Hopley, Director of Civil Defense Planning, stated in a letter of transmittal of the Hopley Report to the late James Forrestal, Secretary of Defense, dated October 1, 1948, that "It is the purpose of this report to recommend for adoption a permanent *peacetime* system of Civil Defense, which will round out our defense structure and which, in the *event of an emergency,* can be quickly and easily expanded to meet the exigencies of a given situation. Such an organization can also be of great value in support of existing agencies in meeting devastating peacetime disasters, such as fires, *floods,* earthquakes, tornadoes, hurricanes, explosions and similar catastrophes."

The suggested Model State Civil Defense Act in Exhibit D of the publication of the National Security Resources Board entitled "United States Civil Defense," Section 3, defines the term "Civil Defense." "As used in this Act, the term 'Civil Defense' shall mean the preparation for and the carrying out of all emergency functions, other than functions for which military forces or other federal agencies are primarily responsible, to prevent, minimize and repair injury and damage resulting from disasters caused by enemy attack, sabotage or other hostile action, or by *fire, flood* or *other causes.* These functions include, without limitation, firefighting services, police services, medical and health services, rescue, engineering, air raid warning services, communications, radiological, chemical and other special weapons defense, evacuation of persons from stricken areas, emergency welfare services (civilian war aid), emergency transportation, plant protection, temporary restoration of public utility services and other functions related to civilian protection, together with all other activities necessary or incidental to the preparation for and carrying out of the foregoing functions."

If state, county, and city laws do not meet the above requirements, they should be rewritten.

It would appear that if legally constituted authorities do not prepare basic laws without loopholes and do not act if laws are on the statutes, that added safeguards in the public interest are required.

The flood disaster has revealed the great need for mutual aid agreements in order that surrounding communities may give aid legally to the stricken areas. State lines must, and I repeat, must, be abolished by mutual aid agreements, between the governors of adjoining states. Mutual aid arrangements must be made by each local organization for Civil Defense with other public and private agencies within each state for reciprocal Civil Defense aid and assistance in case of disasters too great to be dealt with unassisted.

The public can tolerate no longer the lack of central control during a major catastrophe, state lines notwithstanding. The action of individuals in a host of disconnected organizations, all acting independently, cannot be controlled. Duplication of services is exceedingly wasteful of public and private funds and not in the public interest. Uncontrolled press and radio releases contribute to mass panic and stall the necessary immediate control of the forces of nature and enemy action or both in the devastated areas. Public and volunteer services must be coordinated in the interests of a stricken community.

The time for excuses is past. We have had a warning in the Midwest of what to expect should atomic warfare come. The entire nation can learn a lesson from the experiences during the Kaw

Chief Medical Officer, Naval Air Station, Olathe, Kansas.

and Missouri Valley floods. No other good can result from this flood, as a billion dollars have gone down the rivers, lost forever. We can, however, improve our plans and organizations, should atomic warfare or another major disaster occur.

What specifically of a constructive nature can come from this disaster? Disaster and Civil Defense Vigilante Committees should be organized, embracing metropolitan areas. These committees should be composed of a group of outstanding citizens who are willing to contribute their time. The organizations should act as watchdogs on all Disaster and Civil Defense activities.

The purpose of such committees would be: (a) review of all Disaster and Civil Defense laws now on the statutes, state, city and county; (b) review all proposed legislation on Disaster and Civil Defense, state, city and county; (c) review the regulations under which volunteer disaster agencies function; (d) make recommendations for changing, rewriting or strengthening of all Disaster and Civil Defense laws and acts and regulations governing the activities of voluntary disaster agencies; (e) acquire legal aid for guidance; (f) acquire an executive secretary to collect facts for study; (g) stimulate states, counties and cities to organize their Disaster and Civil Defense units for *operational purposes;* (h) act as a public relations organization for Disaster and Civil Defense.

A few of the subjects needing study and resulting recommendations are as follow: (a) Dispersion of new industry. (b) City circling railroad spurs and highways. (c) Emergency sources of water. (d) Emergency sources of medical supplies and equipment. (e) Emergency transportation facilities. (f) Storage depots near large cities. (g) Emergency lighting systems. (h) Fire control. (i) Police control. (j) Warden systems for manning emergency stations *before the emergency strikes* and during the emergency. (k) Sabotage.

The Great Flood should teach us that now is the time for *decision.* Either the funds of the American Red Cross and the appropriation for the Department of Defense should be greatly augmented to take care of Disaster and Civil Defense responsibilities, or Civil Defense in the United States should be *aggressively* and *intelligently* advanced. We should not squander public funds nor waste the time and energy of thousands of volunteer workers on a Civil Defense organization which does not function at the time of crisis, and whose basic laws are shot full of loopholes, enabling escape from responsibility for inaction.

934 Argyle Bldg.,

MEDICAL JOURNAL CITES DANGER IN OVERDOSES OF VITAMIN A

Don't give a child more than the prescribed amount of vitamin A on the theory that this will remedy an insufficiency much sooner. Instead, it may cause a swelling of bones and soft tissue and bring on distress.

This danger was cited in the July 28 *Journal of the American Medical Association* by Dr. Irving E. Rineberg, St. Peters' General Hospital, New Brunswick, N. J., and Robert J. Gross, New York Medical College, New York.

They reported a case involving a 33 months old girl. The child at the age of 2 had been put on a dietary vitamin supplement of vitamin A and D because of a diagnosis of mild rickets. The daily dosage was fixed at five drops of a particular product.

Nine months later, the child had developed a swelling in the left ankle and walked with a limp. A swelling of the wrist also occurred, and the girl experienced pain on moving the wrists. Upon being hospitalized, it was found that the mother, desiring to make up the deficiency of vitamin D quickly, gave the child one teaspoonful of the preparation daily. This had been continued for nearly nine months.

The child recovered spontaneously when the vitamin preparation was discontinued. The symptoms returned when administration was resumed and disappeared again when the medication was stopped.

PEPTIC ULCERS RELIEVED BY SEVERANCE OF NERVE

Surgical severance of the vagus nerve is an effective therapy for peptic ulcers which do not respond to medical treatment, according to two Chicago surgeons.

Based on a seven year study of the results of all vagotomies at the University of Chicago Clinics, Dr. Lester R. Dragsted and Dr. Edward R. Woodward concluded that "this is a relatively safe, efficient and practical method of surgical treatment." They reported their findings in the March 17 *Journal of the American Medical Association.*

In the period covered by their studies, vagotomies were performed on 509 patients. They reported:

"Four hundred and eight (80 per cent) of these patients are entirely well at the present time and are back at their usual occupations on unrestricted diets without any type of medication. Fifty-four (11 per cent) are apparently free of active ulcer disease but complain of some gastrointestinal symptoms, so that the results cannot be considered entirely satisfactory. Forty-seven (9 per cent) of the operations are considered failures."

To indicate the progress made in the technic, they analyzed the last 100 cases of the series, reporting good results in 87 per cent of the cases and fair results in 13 per cent. They added:

"There were no cases in which the ulcers failed to heal or symptomatic relief was not obtained and in which there were other disabling complications."

In some instances, vagotomy was performed in combination with gastro-enterostomy.

The beneficial effect of vagotomy is due to the decrease in gastric secretion produced by the elimination of the nervous phase of stimulation, it was pointed out. There is now satisfactory proof that patients with duodenal ulcers differ from normal persons in that they secrete an excesive amount of gastric juice in the fasting stomach between meals and as the result of the stimulus of food and other substances, they said.

"The healing of these ulcers following vagotomy supports the view that the excesively corrosive properties of the gastric content are due to a hypersecretion of nervous origin," the doctors said.



Two of these physicians suspected the worst...

but not until the significance and the incidence of amebiasis were thoroughly revealed at a hospital staff meeting. This meeting was held in a large city well north of the Mason-Dixon line, hardly a "tropical" climate, yet the incidence was high.*

The two staff men recognized that the symptom pattern of amebic dysentery fitted their experience of several months past and stool examination revealed that they, too, had amebiasis. A course of treatment for these physicians with Milibis-Aralen was completely successful.

Milibis — bismuth glycolylarsanilate — has given excellent results in thousands of cases. In 82.6% of patients followed parasitologically for prolonged periods, negative stools were obtained consistently after 1 to 4 courses of Milibis.

Because intestinal amebiasis may be complicated by extra-intestinal involvement, it is recommended that Aralen (chloroquine) diphosphate be employed in addition to Milibis for the treatment of all cases of amebic infection.

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*Towse, R. C., Berberian, D. A., and Dennis, E. W.: *New York State Jour. Med.*, 50:2035, Sept., 1950.

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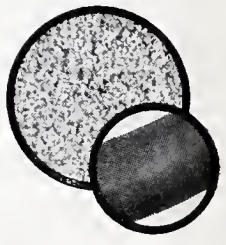
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The "RAMSES" Diaphragm is intended for use with "RAMSES" Vaginal Jelly to provide optimum protection for the patient.

1. Clark, Le M.: The Vaginal Diaphragm. St. Louis, C. V. Mosby Company, 1938; p. 43.
2. Dickinson, R. L.: Techniques of Conception Control. Baltimore, Williams & Wilkins Company, 1950; p. 17.





Unretouched photomicrograph of the dome (enlarged 10 diameters) and the rim (inset) of a "RAMSES" Flexible Cushioned Diaphragm.



Unretouched photomicrograph of the dome (enlarged 10 diameters) and the rim (inset) of a conventional-type diaphragm.

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Editorials

The Tax Burden and the Professions

The writer remembers a time when he first started to practice medicine when there was reasonable assurance that a professional man could by thrift and exercise of what was then known as common "horse sense" save enough for a comfortable old age without calling on the relatives for assistance or on the state for a dole. This, however, has changed drastically, and the men whose capital is in their heads, not in machinery, real estate, oil or other tangible things, have lost this old assurance which attached to ability and brains. This has all been wiped out by discriminatory taxation aimed at professional people and all those who earn their income by personal effort. It bodes ill for the future of the nation when these professional people become restive and commence to believe that there is no incentive to do their jobs well or to practice the old virtues of thrift and hard work and commence to wonder whether their efforts or their skills are worthwhile, or even appreciated. This plight of professional people includes physicians, nurses, teachers, engineers, lawyers, ministers and others. These are the people who have only a limited number of peak earning years. After that they are put on the shelf, their earnings drop and, under the present system of taxation, they have been able to save but little. Professional people have recognized the situation for years, but no organized effort has been made to alleviate the condition. They have been marvelously patient and entirely too tolerant with the extravagance, waste and discrimination of the government.

Our Missouri Senator, James P. Kem, was, I believe, the first of the government representatives to take notice of this inequity. He discussed the problem clearly in an address before the lawyers Association of Kansas City on November 12, 1947, and later recorded in the *Congressional Record* of the 80th Congress. I would like to quote from Senator Kem's address:

"1. THE INCIDENCE OF THE FEDERAL INCOME TAX ON THE PROFESSIONS

"The Federal income tax, as its name indicates, is intended to be a tax on income, not a tax on capital. There are three forms of income: (a) investment return, (b) capital gain, and (c) earned income.

"Adam Smith, in his 'Wealth of Nations,' considered that all income should be taxed alike. He asked but one question in determining ability to pay: "How much is your income?" This test, however, is not followed in every case in our income tax laws. We have gone far afield in affording, for one reason or another, special treatment to various groups or classes. My thesis tonight is that earned income, particularly in the case of a professional man, is entitled to special consideration. This applies to the members of all professions —lawyers, doctors, teachers, engineers, registered nurses, and the rest; in fact, to all persons who earn their income by personal effort. Those who make a living largely by their own efforts expect to bear a full share of the cost of government. They would be something less than human if they did not before long become restive under the burden of more than a just proportion.

"When a businessman spends a sum of money in order to obtain machinery, equipment, or buildings, necessary in his business, he acquires what is called for tax purposes a capital investment. He may allocate the cost, so much per year, over a number of years, and deduct for Federal income tax purposes a yearly percentage of the cost. In this manner, he is permitted to deduct from his income, free from income tax, the cost of the necessary equipment to engage in his business. By use of this method of calculating his tax, the businessman does not pay a Federal income tax on that portion of his capital which, theoretically at least, he uses up year by year. This is referred to as an allowance for depreciation.

"The reason for this deduction is obvious. If it were not allowed, money would not readily be invested in enterprises, sometimes financially hazardous, which are essential to industrial development and progress. Production, so necessary for the Country's well-being, would be adversely affected.

"Now let us examine this situation as it is applied to the professional man. Before he can engage in his chosen calling, he is schooled for several years at a considerable cost in order to obtain the specialized knowledge and skill required to engage in the practice of his profession. Usually a license is required, and not infrequently the requirements to qualify for the license include a specified number of years in an approved technical school. This specialized training corresponds to the machinery and equipment of the businessman. It is the professional man's capital investment. However, a deduction for depreciation or depletion is not allowed as a means of recovering funds that have been invested in acquiring the skill and knowledge of the profession.

"The engineer who develops a patentable process or machine cannot charge off against his taxable income the cost of acquiring the knowledge which was basic to the invention. However, the businessman who purchases that machine or process can, over a period of time, charge off the cost to him of the purchase. The cost to a businessman of the use of a lawyer's specialized skill and knowledge, enabling the businessman to operate within the established rules of law, can be deducted as a business expense. But the cost of an essential element to the engineer and the lawyer,

50 *and four*

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viz., the cost of obtaining the specialized knowledge and skill, cannot be treated as a capital investment or as a business expense. The physician, the accountant, the teacher, the registered nurse, and the other professional people find themselves in a similar predicament under the present tax laws.

"If the professional man is to be given the same treatment with respect to income tax as is given to the businessman, he will be permitted to recover through the equivalent of a depreciation charge against taxable income the basic capital he has invested in purchasing an essential item of equipment in order to engage in his profession. In the case of the professional man the need to use this method is greater than in the case of the businessman, because skill and knowledge, unlike machinery, buildings, and other tangible capital, have no resale value and no salvage value.

"Opportunities to earn income by employment are lost during the years of education. There is no interest on the money expended in receiving the training. The period of substantial earnings for a professional man is usually not reached until the late thirties and is over all too soon. The benefit to the professional man to be derived from a charge against his taxable income for this purpose would be especially helpful to him during the lean period after entering the profession and before reaching the period of substantial earnings.

"II. THE REASONS FOR EARNED-INCOME RELIEF

"Several cogent reasons may be assigned for special treatment for tax purposes of professional income. Let us summarize them.

"1. The professional man is entitled to something in the nature of a depreciation or depletion allowance.

"The professional man is constantly wearing out his physical and nervous equipment. Each year marks a milestone toward the end of his professional usefulness. He is using up his reserves of strength just as the reserves of a mine or oil well are depleted. In the case of mines, oil and gas wells, and other natural deposits and timber, the Internal Revenue Code provides for 'a reasonable allowance for depletion—according to the peculiar conditions in each case—to be made under rules and regulations to be prescribed by the Commissioner.' The courts have said that deduction of depletion for income-tax purposes is permitted as an act of grace in recognition of the fact that mineral deposits are wasting assets, and is intended as compensation to the owner for the part used up in production.

"A lawyer's intellect, a doctor's skill, a nurse's special care, a teacher's instruction, or a business executive's energy are not fixed or indestructible capital, capable of producing an income forever. Yet the income they produce is taxed more severely than that from capital because capital is permitted to replenish its loss tax free by dipping into income through depreciation, obsolescence, and depletion.

"2. The professional man is put to much incidental expense.

"The individual with earned income has expenses not borne by the individual with investment income. The former must live near his place of employment and maintain a standard of living in keeping with his position. On the other hand, the investor may elect to reside wherever he pleases, thus avoiding the extra expenses required in a particular community, and his standard of living does not necessarily have an effect on the return derived from his investment. Inasmuch as the major portion of these extra expenses borne by the individual with earned income is not deductible for tax purposes, such as going back and forth between home and place of work, it results that earned income is taxed to some extent on a gross basis, while investment income is taxed on a net basis.

"3. Earned income is uncertain.

"Earned income is more uncertain than income derived from capital. If an investor is not too much lured by the posibility of an extravagant return, he may assure himself of a reasonably stable income. On the other hand, the individual with earned income is always confronted with the possibility of illness or accident, either of which may temporarily or premanently suspend his income, thus creating the necessity of savings to protect himself and his family from the possibility of that time when earned income ceases or is substantially reduced. The earned income stops short at the death of the earner.

"4. Capital gains are accorded special treatment.

"As has been said, the present law recognized the need of special treatment for income derived from certain sources, particularly capital gains. The Revenue Code imposes a tax of not over 25 per cent on the gain from the sale or conversion of capital assets held for a period of more than 6 months. There appears to be no reason why earned income arising from personal endeavor should not receive at least as much consideration as capital gains occuring in many cases without effort on the part of the taxpayer.

"5. An incentive should be provided for work and effort.

"Considerations of public policy are involved. Lightening the burden on income derived from personal earnings would encourage added effort to receive the gain. It should stimulate the personal initiative, the additional hour, and the extra ounce of energy so essential to a highly productive economy.

"There is still another benefit to the public from fair treatment to the professions in this respect. Young men and women would be encouraged to enter training for them, at a time when we hear much of the shortage of doctors, dentists, nurses, and teachers. Also, postgraduate training would be encouraged and the level of competence would be raised."

Nothing more was heard about the subject

aside from a few rumblings since Senator Kem's address until recently when Senator Ives of New York introduced an amendment to the Revenue Act of 1951. This amendment in brief is quite simple and seeks to correct the inequities of taxation of professional people. It provides that a certain percentage of income can be deducted for investment in approved trust funds. No income taxes would be paid on such funds until retirement age or disablement when income had dropped and the taxpayer would be in a lower tax bracket.

Provisions for retirement and withdrawal are outlined in the Act as quoted:

"The taxpayer can retire and draw benefits at age 60. And if total and permanent disability occurs before the age of 60, the taxpayer may draw benefits then.

"Upon retirement, any participating member will generally elect to draw his benefits in one of two ways: either in a lump sum or in annual installments.

"If benefits are drawn in a lump sum, that sum will be taxed as a long-term capital gain to the beneficiary. This tax rate, presently, cannot exceed 25 per cent. For tax purposes lump sum benefits under this amendment are treated exactly like similar benefits under employer-created pension trusts. If benefits are taken in annual installments, each installment is taxable as income to the recipient when received.

"There is a third method of benefit distribution. A participant may direct the trustee of the fund to purchase from an insurance company a retirement policy. Under this amendment such policies must be non-commutable and non-assignable. However, policies are descendable. The taxpayer, or his beneficiary in case of death, would be taxed for benefits as received."

Senator Ives concludes:

"This amendment removes a current inequity. Savings for retirement would be made possible for the bulk of our professional people and farmers. The self-employed should be put on an equal footing with the rest of our working population."

This amendment has been approved by the American Medical Association House of Delegates and it deserves the backing of every professional man or woman. We want and expect to pay our just share of taxes, but we resent the obvious discrimination against us. However, Senator Ives and Senator Kem cannot correct this alone. They will need your approval, and you must communicate your thoughts and devices to your Senators and Representatives all over the nation to get this bill enacted.

Medical Care Relatively Cheaper Than in 1935-1939

The American Medical Association has reported that the price of medical care, including drugs, hospital room rates and physician and dental services, was relatively 14 per cent cheaper in 1950 than during 1935-1939.

This was revealed in the Consumers' Price Index, compiled by the U. S. Bureau of Labor Statistics.

The Bureau's Index indicated a 72 per cent rise in the cost of living since the 1935-1939 base period while, at the same time, showing that medical care prices rose only 48 per cent.

The increase for food, the Index showed, was 104 per cent; apparel 88 per cent; rent 31 per cent; fuel, electricity and refrigeration 41 per cent; house furnishings 90 per cent, and 57 per cent for the items which the Bureau of Labor Statistics classified as miscellaneous. Only two of these items—rents, and fuel, electricity and refrigeration—rose less rapidly than medical care prices.

The 72 per cent rise in the cost of living as compared with only a 48 per cent rise in medical care prices indicates that for every $1 paid for goods and services generally in 1935-1939, the 1950 consumer had to pay $1.72. On the other hand, the medical care purchased for $1 in 1935-1939 cost only $1.48 in 1950.

An analysis of the Index discloses further that a dollar in 1950 could buy 68 cents worth of medical care but only 58 cents worth of all goods and services, or 86 per cent as much. The 1950 purchasing power of the dollar was 86 per cent as high in terms of goods and services, generally, as it was in terms of medical care prices only. Thus, in terms of the purchasing power of the 1950 dollar, medical care was relatively 14 per cent cheaper than in 1935-1939.

Physicians' fees, according to the Index, rose 40 per cent or only a little more than half as rapidly as the entire cost of living, which rose 72 per cent.

Only hospital room rates, which increased 135 per cent, have risen faster than the entire Consumers' Price Index.

"The high hospital rates," an American Medical Association study of the Consumers' Price Index said, "reflects the fact that hospitals are singularly exposed to the forces of inflation."

Commenting on the relatively cheaper medical care prices today, Dr. John W. Cline, San Francisco, President of the American Medical Association, said that "physicians recognize that the cost of medical care, especially hospital care, is a serious budget item for many persons. Therefore, the doctors are strongly supporting various voluntary prepayment insurance plans to help meet these costs."

"The fact is, however," Dr. Cline continued, "that, as shown by official government statistics, medical care prices today, as compared with the prices of all goods and services, are relatively less than they were 15 years ago."

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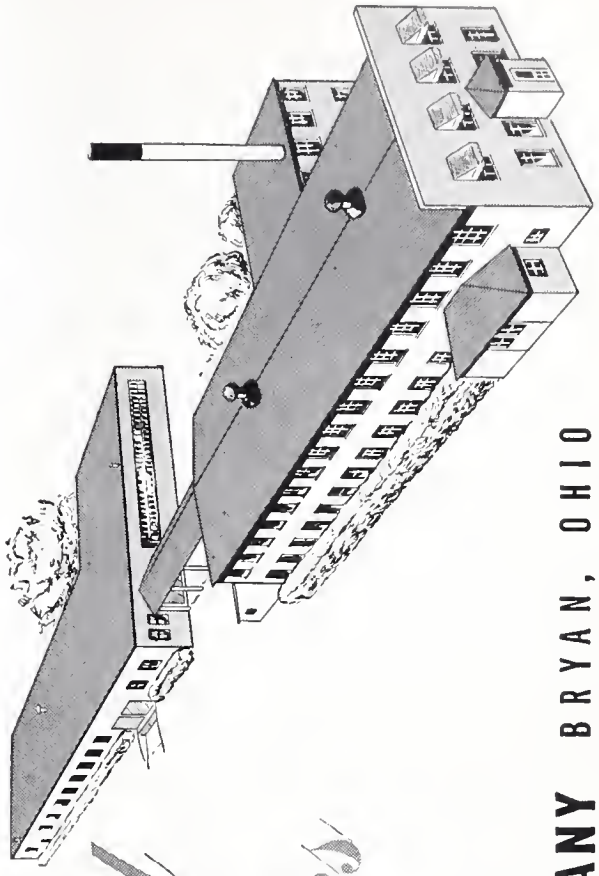
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Organization and Economics

NEWS

James F. Dowd, M.D., St. Louis, will speak on "Treatment of Common Injuries Resulting From Automobile Accidents" at a meeting of the General Practitioners Study Club of Greater St. Louis on October 17.

Mount St. Rose Sanatorium, St. Louis, will celebrate the fiftieth anniversary of its establishment by a two day open house, October 6 and 7, and will feature exhibits tracing the history of tuberculosis and treatment during the last fifty years.

J. Albert Key, M.D., St. Louis, will act as chairman of one of the sessions of the clinical congress of the American College of Surgeons which will convene in San Francisco November 5 to 9.

The State Board of Medical Examiners will give examinations for licensure on October 18, 19 and 20 in Kansas City. The Board will meet on October 17 to consider reciprocity applications.

MUSINGS OF THE FIELD SECRETARY

The American Medical Association exhibit on "Mechanical Quackery" shown at the Missouri State Fair last month reached many people normally unreached by other avenues of educational approach. The assistance of Mr. Oliver Field and Mr. George Larson from the American Medical Association headquarters in explaining the exhibit to the visitors was invaluable.

Some of the fake gadgets making up the display received a great deal of attention in that they are purported, in painless fashion, to grow hair on bald heads, restore hearing, eliminate need for eyeglasses and even, in a manner of speaking, making young men out of old.

An exhibit of this type using as its chief appealing factor that of redicule applied to fakery seems to reach a good segment of any cosmopolitan group. It is, however, placing emphasis primarily from a negative angle as contrasted with a display of those items of medical progress spotlighting the positive.

In many instances, the individual is duly impressed when contrasts are brought to his attention. Such an exhibit as the one on "Mechanical Quackery" furnishes an effective contrasts to recent medical progress, especially when the exhibit has its narrator.

A new pamphlet entitled "A Doctor for You" has been prepared recently by the American Medical Association Public Relations Department. The pamphlet is designed to tell the American people what is being done to provide a well trained, understanding physician for everyone. Copies of the pamphlet may well be made available in physicians' offices. A supply will be mailed from the State Association office upon request.

NEW MEMBERS

Biggs, Harry L., M.D., Raytown.
Butterworth, Nelson St. Clair, M.D., Joplin.
Groce, Nathan W., M.D., Chillicothe.
Lewis, Revis C., M.D., Kansas City.
Mandler, George, M.D., Chillicothe.
Mundy, William L., M.D., Kansas City.
Murphy, Jerome P., M.D., Mission, Kansas.
Smith, Roland T., M.D., Joplin.

DEATHS

Hoke, Wilbur J., M.D., St. Louis, a graduate of St. Louis University School of Medicine, 1931; Fellow of the American Medical Association; member of the St. Louis Medical Society; aged 45; died July 15.

Dawson, John W., M.D., Eldorado Springs, a graduate of the St. Louis College of Physicians and Surgeons, 1896; Fellow of the American Medical Association; honor member and past president of the Vernon-Cedar County Medical Society; aged 78; died July 20.

Wheeler, William M., M.D., Sedalia, a graduate of the University of Louisville School of Medicine, 1893; aged 82; died July 22.

Thurlow, Ralph M., M.D., Kansas City, a graduate of the Hahnemann Medical College and Hospital, Chicago, 1914; member of the Jackson County Medical Society; aged 60; died August 14.

Corley, Henry Norbert, M.D., St. Louis, a graduate of Marion-Sims College of Medicine, 1896; honor member of the St. Louis Medical Society; aged 83; died August 22.

MISSOURI STATE FAIR

The attendance figure at the Missouri State Fair, August 18 to 26, reached the 433,000 mark for the first time since the discontinuing of the two week fair some years ago.

For the second consecutive year the Missouri State Medical Association in cooperation with other voluntary health organization members of the Missouri Health Council sponsored "A Hall of Health Exhibit." This entire exhibit was housed in the Educational Building. The Association display, which was a project of the Committee on Health and Public Instruction, received an



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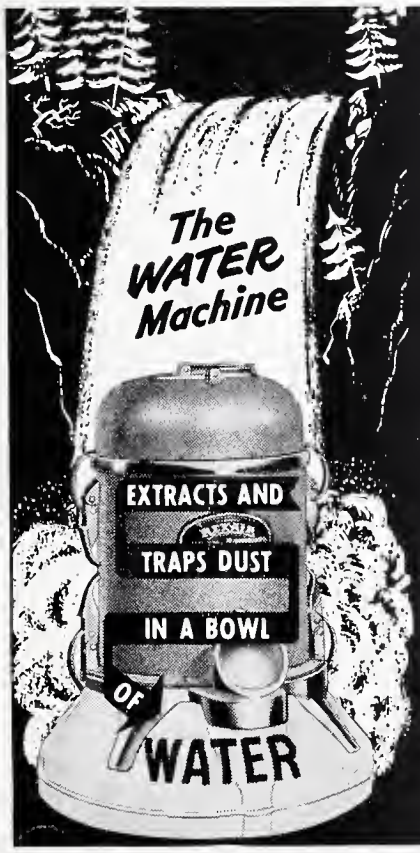
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Exhibit at the Missouri State Fair

unusual amount of attention and favorable comment from the thousands of visitors to the Hall of Health. The display featured the exhibit on "Mechanical Quackery" of the American Medical Association through the courtesy of the Bureau of Scientific Exhibits.

LABORATORY COURSE IN HEMORRHAGIC DISEASES

The Division of Health of the State of Missouri, Buford G. Hamilton, M.D., Director, will sponsor a workshop in laboratory procedures applicable to hemorrhagic diseases and anticoagulant therapy under the auspices of St. Louis University School of Medicine. The course is offered to all qualified medical technicians. It will be given from October 22 to 27 at Firmin Desloge Hospital, St. Louis. Enrollment is limited to six and it is contemplated that if the demand is sufficient, the course will be repeated at intervals during the year. There is no tuition but housing and transportation are not furnished. Application blanks may be obtained from R. O. Muether, M.D., 1325 S. Grand Ave., St. Louis.

BOOK REVIEWS

Practice of Medicine, The, by Jonathan Campbell Meakins, C.B.E., M.D., LL.D., D.Sc., Formerly Professor of Medicine and Director of the Department of Medicine, McGill University; Formerly Physician-in-Chief, Royal Victoria Hospital, Montreal; Formerly Professor of Therapeutics and Clinical Medicine, University of Edinburgh; Fellow of the Royal Society of Edinburgh; Fellow of the Royal Society of Canada; Fellow of the Royal College of Physicians, London; Fellow of the Royal College of Physicians, Edinburgh; Honorary Fellow of the Royal College of Surgeons, Edinburgh; Fellow of the Royal College of Physicians, Canada; Fellow of the American College of Physicians; Honorary Fellow of the Royal Society of Medicine. Fifth edition. With 518 illustrations including 50 in color. The C. V. Mosby Company, St. Louis. 1950. Price $13.50.

This unusually beautiful volume is an excellent addition to a doctor's library. In the discussion of symptoms and their causes will be found many helpful suggestions for the general practitioner. The wide range of subject material has been treated in a scholarly manner, indicative of extensive experience, vast study and productive thought. The fifth edition shows great improvement over the four preceding editions published in 1936, 1938, 1940 and 1944.

The book has a chapter devoted exclusively to the field of biochemistry. The fact that Terramycin, Corti-

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Advertisement



From where I sit *by* Joe Marsh

Skip Makes a Slip

Miss Gilbert, the teacher, was telling me how Skip Lawson almost went to sleep in her physics class.

She saw him nodding and—since they were studying electricity—said in a loud voice: "Maybe MR. LAWSON will explain to us what electricity is." Skip started up, looked around wildly, and blurted out,"Gee! I used to know, Miss Gilbert, but somehow I forgot."

"What a loss to science!" sighs Miss Gilbert. "No one to this day knows what electricity really is, and here we have a genius who could explain it—but forgot!"

From where I sit, I hope this taught Skip that you're better off if you admit you *don't* know all answers. Some grownups haven't learned that yet—like the ones who are always telling other people how a man should practice his profession, or what beverage is "good" for a person. I like a temperate glass of beer, myself, but if you prefer buttermilk I won't argue. I've seen too many "know-it-alls" turn out to be wrong!

Joe Marsh

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sone and ACTH are not mentioned at all probably indicates that this part of the book has been written earlier than would be expected in a 1950 edition. This detracts little from the excellence of the book.

The illustrations, five hundred in number, include about sixty color photographs. To the scientific discussions have been added frequent observations of a philosophical type. The author's evident familiarity with medical history and with sciences allied to medicine makes a perusal of this work interesting and instructive.

Dr. Meakins has a natural facility of speech. His excellent diction, which invariably selects exactly the right word, is unusual in medical literature. This, combined with an extensive vocabulary, makes this book profitable and delightful reading. D. T. M.

Clinical Auscultation of the Heart by Samuel A. Levine, M.D., Clinical Professor of Medicine, Harvard Medical School; Physician, Peter Bent Brigham Hospital; and W. Proctor Harvey, M.D., Research Fellow in Medicine, Harvard Medical School; Assistant in Medicine, Peter Bent Brigham Hospital. Illustrated. W. B. Saunders Company. Philadelphia-London. 1949. Price $6.50.

Dr. Levine with his coworker, Dr. W. Proctor Harvey, has again presented to medicine another of his well written and instructive books. Dr. Levine has the knack of correlating the facts gained through his broad clinical and teaching experience and putting them in easily readable form. This new treatise thus becomes an excellent source book not only for the medical student but for the teacher and practitioner as well. The book is profusely illustrated by electrocardiograms and simultaneous phonocardiograms, all of superior quality, which emphasize and clarify the text.

Some years ago in reviewing Levine's "Clinical Heart Disease" I stated that the book could be highly recommended to the medical student. I now make the bold statement that this companion volume should be a "must" for the medical student and if I may coin a phrase a "near-must" for all practicing physicians, regardless of their specialty, if they use a stethoscope and want to get the most out of it for their patients.

A. E. S.

Medical Diagnosis, Applied Physical Diagnosis. Edited by Roscoe L. Pullen, M.D., F.A.C.P. Professor of Graduate Medicine, Director of Graduate Medicine, and Vice Dean of the School of Medicine, Tulane University of Louisiana; Senior Visiting Physician, Charity Hospital of Louisiana at New Orleans; Consultant in Medicine, Veterans Administration Hospital, New Orleans, Louisiana; Consultant to the Surgeon General, Department of the Army, Washington, D. C. Second Edition. With 601 Figures, 48 in Color. W. B. Saunders Company, Philadelphia and London. 1950. Price $12.50.

The author of this second edition, with the assistance of many well qualified contributors, presents an excellent textbook on medical diagnosis, retaining the original method of presentation employed in the first edition. Correlation of bedside observations and the interpretation of accessory laboratory and roentgenographic findings is emphasized. Several sections have been completely rewritten. The revised chapter on electrocardiographic diagnosis is most complete. New chapters include one on the bedside diagnosis of blood diseases, one on medical diagnosis in the aged and one on the physical examination of the psychiatric patient. This book can be recommended for the student and general practitioner. R. V. P.

A Text-book of X-Ray Diagnosis by British authors in four volumes. Second Edition. Edited by S. Cochrane Shanks, M.D., F.R.C.P., F.F.R., Director, X-ray Diagnostic Department, University College Hospital, London; and Peter Kerley, M.D., F.R.C.P., F.F.R., D.M.R.E., Director, X-Ray Department, Westminster Hospital, Radiologist, Royal Chest Hospital, London. Volume III with 694 illustrations. W. B. Saunders Company, Philadelphia and London. 1950. Price $18.00.

This is the third of a four volume series on roentgen diagnosis contributed to by many collaborators, both radiologists and clinicians, each distinguished in his special branch. This volume covers the alimentary tract, the biliary tract, the abdomen, radiology in obstetrics, gynecologic radiology and the urinary tract. More than two thirds of the text is devoted to the first two subjects.

This is a comprehensive textbook which covers in considerable detail the roentgen diagnostic features of the afore-mentioned subjects. The book contains a large number of illustrations and diagrams, but the x-ray reproductions have not been reversed to the original and are initially strange to the reader. The bibliography at the end of several of the sections could be more detailed, especially with regard to the titles of the references. In an attempt to cover a tremendous field, many important subjects have been dealt with briefly. Small intestinal obstructions, choliangiography and the newer methods of opacification of abdominal vessels are mentioned only briefly.

This is an excellent text and reference book which covers a large field and will be of great value to diagnostic roentgenologists as well as specialists in the various fields covered in this volume. H. R. S.

Gynecology, A Textbook of. By Arthur Hale Curtis, M.D., Emeritus Professor and Chairman of the Department of Obstetrics and Gynecology, Northwestern University Medical School; formerly Chief of Gynecological Service, Passavant Memorial Hospital, Chicago; and John William Huffman, M.D., Associate Professor of Obstetrics and Gynecology, Northwestern University Medical School; attending Gynecologist, Passavant Memorial Hospital, Chicago. Sixth Edition with 446 illustrations, chiefly by Tom Jones, including 37 in color. W. B. Saunders Company, Philadelphia and London. 1950. Price $10.00.

This new edition contains 763 pages of text with four hundred sixty-six illustrations, most of them by Tom Jones, including thirty-seven in color. All gross and microscopic illustrations are good to excellent. The lucid chapter by Anson and coworkers on the anatomy of the female pelvis and perineum is in itself worth the purchase price.

The section on clinical endocrinology has been brought up to date, as have the portions dealing with aureomycin. Space is given to discussion of heparin and dicumarol in the chapter on disturbances of the pelvic veins.

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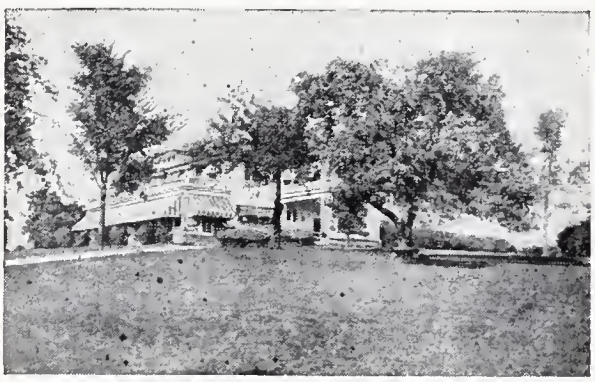
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The arrangement of material is convenient as the illustrations are appropriately inserted in the text, eliminating the need for leafing back and forth through material elsewhere in the volume. Adequate references, the book. However, cross reference is made to related including the year 1949, are given at the end of each chapter. The book is highly recommended for student and practitioner alike. E. G. H.

PHYSIOLOGY OF THE EYE, Clinical Application, by Francis Heed Adler, M.A., M.D., F.A.C.S. William F. Norris and George E. de Schweinits, Professor of Opthalmology, School of Medicine, University of Pennsylvania and Consulting Surgeon, Wills Hospital, Philadelphia. With 319 illustrations, including 2 in color. C. V. Mosby Company. St. Louis. 1950. Price $12.00.

This book is an absolute "must" for not only the student but for the busy opthalmic clinician who finds all too little time to keep up with all the literature.

The concise and careful analysis of the recent contributions to the field of the chemistry of the lens, aqueous and cornea alone are ample justification for this text.

The elucidations in electro-ophthalmology are readable as well as scholarly and bring to a practical level material which heretofore has been regarded by the clinician as beyond his ken, as being too formidable a subject for any but the researcher.

The lavish use of superior illustrations is exemplified in the section on ocular motility which, as presented, is every bit as fascinating as a really good detective story.

Such a volume with its careful documentation, yet critical evaluations of the evidence supporting the contradictory theories on many subjects in ophthalmic physiology, does not have the fault of so many previous works of leaving the reader hanging in the air. The author's treatment is not dogmatic but is polished, practical and intellectually stereoscopic.

This book, like its predecessor, will wear well as a new milestones in opthalmic literature. R. D. M.

YOU AND YOUR HEART, A Clinic for Laymen on the Heart and Circulation, H. M. Marvin, M.D.; T. Duckett Jones, M.D.; Irvine H. Page, M.D.; Irving S. Wright, M.D., and David Rutstein, M.D. Foreword by Paul D. White, M.D. Random House, New York. 1950. Price $3.50.

This book is described as a "clinic for laymen on the heart and circulation." By the simple expedient of having the final writing done by a layman, the authors of this book have been exceptionally successful in presenting scientific information in nontechnical terms. As a result, the subject matter should be easily understood by the layman. The information concerning pathogenesis and symptomatology is particularly well presented. There is, however, one criticism which might make the physician dubious about recommending the book to his patients, namely, that statements concerning which no universal agreement exists are presented in such a light as to give the impression that they may be accepted as facts. For example, the statement is made that following a coronary occlusion it is "customary" to keep the patient under oxygen therapy for the first few days. Another such statement is that, "X-rays of the teeth are often taken as one of the first steps in the attempt to track premature beats to their source." D. A. F.

DIAGNOSIS AND TREATMENT OF BRAIN TUMORS AND CARE OF THE NEUROSURGICAL PATIENT, by Ernest Sachs, A.B., M.D., Research Associate in Physiology, Yale University, New Haven; Formerly Professor of Clinical Neurosurgical Surgery, Washington University School of Medicine, St. Louis. Three hundred forty-eight illustrations and ten color plates. Second edition. C. V. Mosby Company, St. Louis. 1949. Price $15.00.

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This book contains detailed information on every phase of brain tumors and is interesting to the brain surgeon, the neurologist and the practitioner of medicine. H. M. G.

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	Physiologic Effects of Autonomic Discharge	
	Sympathetic	Parasympathetic
Gastro-intestinal System	Hypomotility Intestinal Atony Hyposecretion Reduced salivation	Hypermotility Gastrointestinal spasm Hypersecretion
Cardio-vascular System	Rapid heart rate Peripheral vaso-constriction	Slow heart rate Vasodilatation
Functional Manifestations	Palpitation Tachycardia Elevated blood pressure Dry mouth and throat	Heartburn Nausea-vomiting Low blood pressure Colonic spasm

The data here tabulated is from references [3,4,5,6,7] given below.

When the clinical picture is suggestive of functional disorder, the diagnosis is supported by the presence of the following indications of autonomic lability:

Variable Blood Pressure
Body Temperature Variations
Changing pulse rate
Deviations in B. M. R.
Exaggerated Cold Pressure Reflex
Oculo-Cardiac Reflex Abnormalities
Glucose Tolerance Alterations

Therapy in these cases is directed toward: 1) relieving the somatic disturbance to prepare the patient for psychotherapy*; 2) guidance in making adjustment to stressful situations and correction of unhealthy attitudes.

*Drug treatment using adrenergic and cholinergic blocking agents in conjunction with sedatives. [8,9,10]

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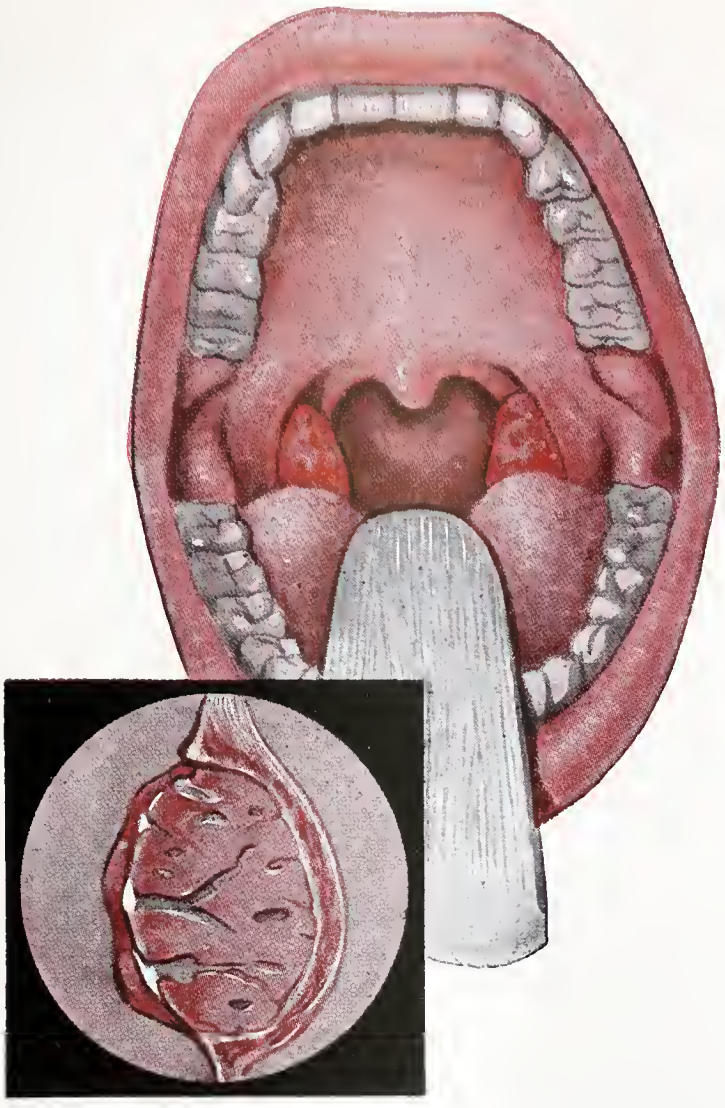
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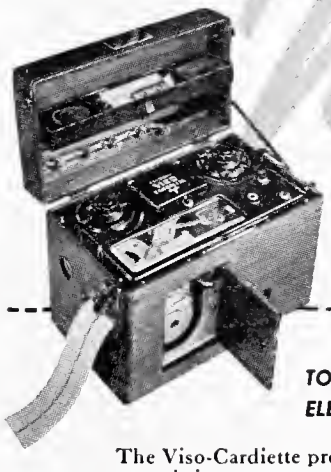
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These manifestations of acute amino acid deficiency noted in the rat can occur as readily in the normal human subject consuming a diet lacking in any one of the eight essential amino acids.[2] Loss of appetite and of body nitrogen accompanied by malaise quickly results. Furthermore, addition of the missing amino acid to the diet quickly restores the appetite, nitrogen equilibrium, and the previous state of health. Apparently, even in normal persons, lack of an amino acid in the diet partially or completely interrupts protein synthesis as well as increases tissue protein catabolism.[1] The conclusion is incontestable, therefore, that adequate protein nutrition is vital for speeding the processes of recovery from massive disease or major surgery.

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1. Cannon, P. R.: Recent Advances in Nutrition with Particular Reference to Protein Metabolism, Lawrence, Kansas, University of Kansas Press, 1950, pp. 56-60.

2. Rose, W. C.: The Nutritive Role of the Amino Acids, The Science of Nutrition, New York, The Nutrition Foundation, 1946.

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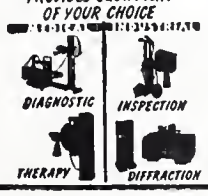
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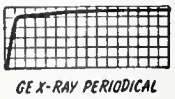
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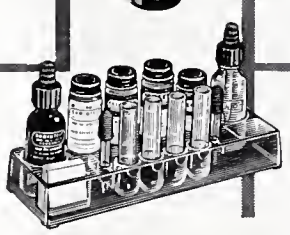
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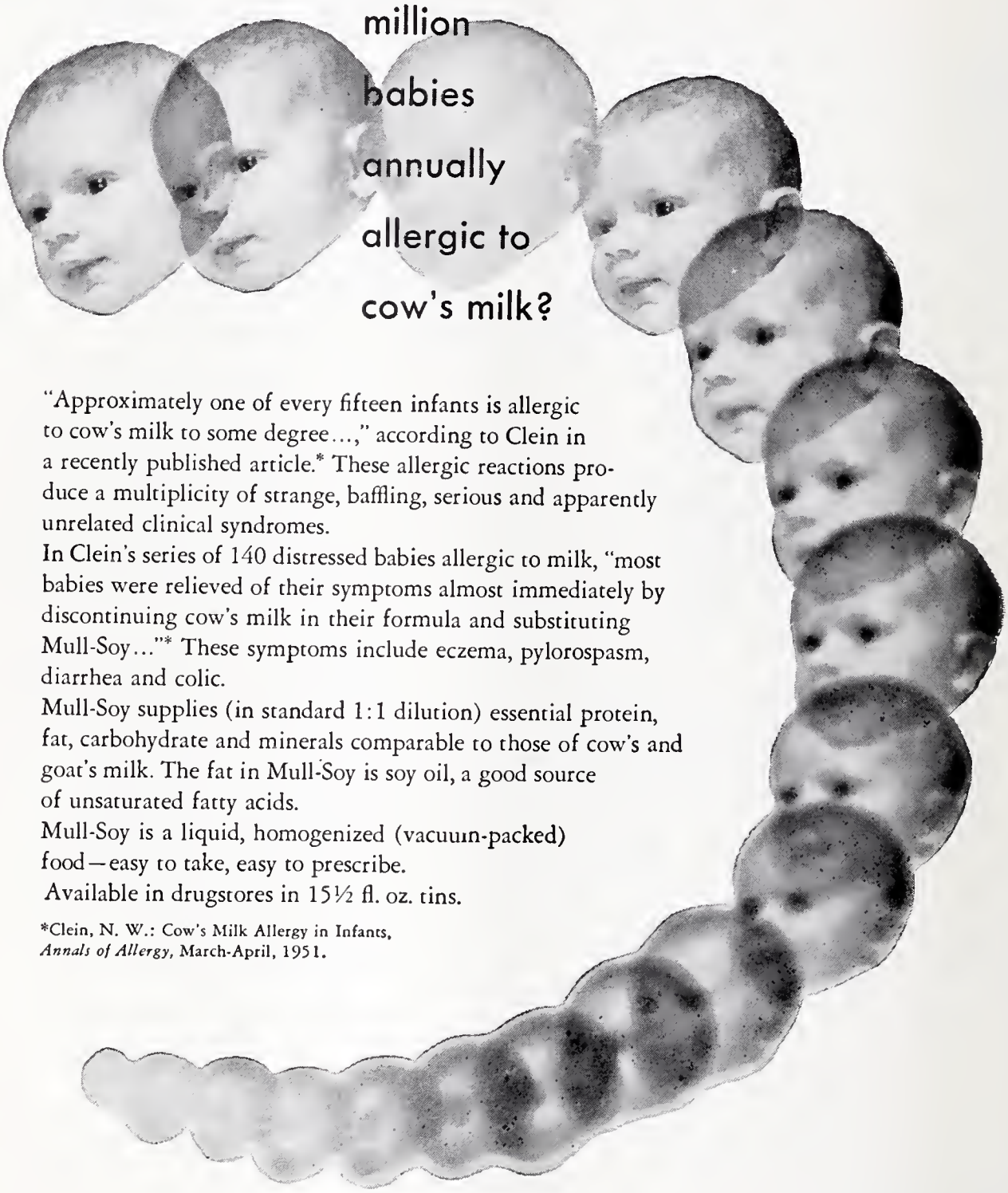
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*Clein, N. W.: Cow's Milk Allergy in Infants, *Annals of Allergy*, March-April, 1951.

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Scientific Articles

CONGENITAL MALFORMATIONS REMEDIAL DURING EARLY INFANCY

JOHN A. BIGLER, M.D.
CHICAGO, ILLINOIS

CONGENITAL MALFORMATIONS are usually due to some abnormality in embryologic development during the first trimester of pregnancy. So far, little has been proven as to the etiology of these deformities. One group of deformities, involving the heart, the eyes and the central nervous system, has been linked definitely to German measles when it occurs during the first trimester of pregnancy. Unfortunately, in most other conditions, the early pregnancy history, according to present knowledge, is usually normal.

If a mother develops German measles during the first trimester of pregnancy, abortion is indicated because of the probability of serious malformations being present in the infant. Such advice should be given only after the consideration of several factors. An interrupted pregnancy would not be serious in a mother who still has the possibility of future pregnancies but, with a childless woman, in whom a future pregnancy seems highly improbable, the situation is different. Then the probabilities should be discussed with the family, letting them make the decision after weighing all the possibilities. It is still felt that some normal infants are born even when German measles has occurred. After the first trimester there seems to be no effect upon the fetus.

The early recognition of all congenital malformations is especially important today because, with the advances in pediatric surgery and the antibiotics, many of the malformations can be corrected and survival expected. All physicians should be alert to the presence of malformations even though they see only an occasional one during many years of practice. The early successful treatment of such conditions lowers infant mortality. Ample evidence of this exists when one makes rounds in a pediatric hospital and when the necropsy records of even ten years ago are compared with those of today.

Cleft Lip.—This is one of the most common

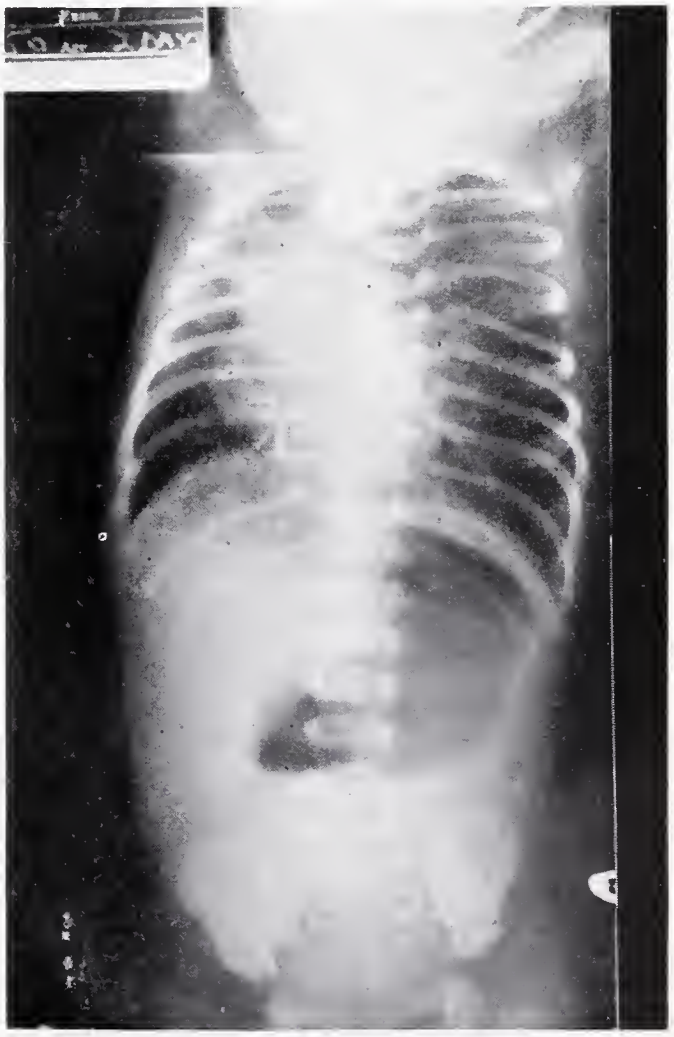


Fig. 1. Esophageal atresia with tracheo esophageal fistula, upper blind pouch filled with material, atelectasis of right upper lobe with air pouch to right. Air pattern in stream, first portion of duodenum only in intestinal air pattern indicated that this child has an esophageal tracheo fistula obstruction of the duodenum which must be corrected for the child to survive.

From the Children's Memorial Hospital, Chicago, Illinois and Northwestern University Medical School, Chicago, Illinois.

Read before the 93rd Annual Session of the Missouri State Medical Association, Kansas City, April 23, 1951.

anomalies with a determined incidence which varies little from year to year. The cleft may be single or double, it may be slight or it may extend into the nostril. It may, or may not, be associated with a cleft palate.

Surgical repair of the cleft lip should be done early, even though a cleft palate is also present. I usually proceed with the repair as soon as the infant has established a good weight gain and is in good physical condition. This may be as early as 2 to 4 weeks of age. Preoperative feeding is usually



Fig. 2. Large, left diaphragmatic hernia with most of the intestine in the right chest. Recovery with surgery.

by bottle, medicine dropper or Breck feeder. Gavage feeding is rarely indicated. Contraindications to early surgery are infection, failure to gain, anemia, diarrhea and prolonged bleeding or clotting time.

Cleft Palate.—This may or may not be associated with a cleft lip. It may involve only the soft palate or it may extend through the alveolar ridge. The mechanics of feeding may be difficult. When the hard palate and alveolar ridge are involved, breast feeding is usually not successful. Feeding with a bottle, rubber tipped medicine dropper or a Breck feeder is usually best. Far too often, gavage feeding is used; frequently, when prolonged, it is difficult to get the infant to take food by any other method because the normal tongue and sucking processes are not brought into play. Recently, a new plastic gavage tube (Plexitron) has been developed which can be left in place without causing any nasal or esophageal irritation.

Early repair of the lip is advisable, but not of the palate as evidence is accumulating that surgical repair of the alveolar ridge and hard palate should be delayed. Attention is now being given to the inherent growth potential of the maxilla and its distortion by early surgery. When cases that are repaired early—often by multiple operations—are compared with those that have been left alone or repaired late, it is found that the resulting deformity to the face and teeth is much greater in the former. Graber has been able to show this by actual measurements. He believes that surgery should not be done before the fifth year at least. Work is now in progress demonstrating that prosthetic appliances can be used during infancy so that the tongue will have contact with the palate and speech will develop normally. The practice of late repair is one of the great advances in surgical thought.

Macroglossia.—This is a rather rare condition usually due to lymphangioma, hemangioma or cretinism. In the latter, thyroid should be given at the earliest possible time. In the two former conditions, early treatment is rarely necessary and can be started later with x-ray, radium or surgery.

Micrognathia.—Hypoplasia of the mandible may be moderate to severe. With this condition two problems present themselves soon after birth—feeding and normal respiration. The tongue usually drops back against the pharynx causing obstruction, cyanosis and the inability to nurse.

Infants with such a condition should be put on their abdomens so that the tongue falls foreward. Oxygen may be necessary. A special nursing bottle with a guard against the maxilla, requiring the infant to reach foreward with the mandible, may help. At times it becomes necessary to suture the tongue, holding it foreward. Often a tracheotomy must be done. With care and thought these infants can be saved.

Tongue Tie.—No matter how severe, clipping of the frenulum is never necessary.

Branchial Fistula, Thyroglossal Ducts and Cysts.—These never require therapy during early infancy. They are usually evident at birth. If the skin in these areas is stretched, usually a dimple will form at the site of the anomaly.

Esophageal Malformation.—As the esophagus and trachea both arise from the embryonic foregut, malformations may involve both structures.

Malformations of the esophagus may be listed as follow: (1) reduplication, (2) atresia, (3) tracheo-esophageal fistula, (4) congenitally short esophagus, and (5) cardiospasm.

Reduplication of the esophagus is an uncommon malformation that rarely produces symptoms during the newborn period. It may produce symptoms by pressure on the esophagus and trachea. Usually it is recognized as homogeneous density in the mediastinal region by x-ray. It rarely has a direct communication with the trachea.

Atresia of the esophagus is not uncommon. One of several forms may occur, such as (1) atresia with a blind upper and lower pouch, (2) atresia with the upper pouch connected to the trachea by a fistula, (3) atresia with the upper pouch ending blindly and the lower pouch with a fistula to the trachea and (4) the lower and upper pouches having a fistula to the trachea.

It is essential that atresias of the esophagus be recognized early. The symptoms are characteristic and evident if the staff is alert. All too often the recognition depends upon the nursing staff. The infant appears normal at birth. Early, there is an accumulation of mucus and gagging, vomiting, choking and cyanosis occur as soon as even a teaspoonful of fluid is taken. This will be repeated every time anything is given by mouth. If the nursing and medical staff are alert these early symptoms will be correctly evaluated. Meconium is passed normally if there is no associated atresia of the bowel.

Usually within from twenty-four to forty-eight hours after birth some atelectasis or pulmonary infection occurs due to aspiration.

A roentgenogram of the chest and abdomen is an aid to diagnosis. Normally, within six to eight hours after birth air is present throughout the gastrointestinal tract. If no air is present in the stomach, then one must think of an esophageal atresia; if air is present in the intestinal tract with esophageal atresia, then there must be a fistula between the trachea and the distal end of the esophagus. Attention should be paid to the whole intestinal gas pattern because of the possibility of an associated intestinal atresia.

If esophageal atresia is suspected a small catheter is passed into the esophagus. If obstruction is met it usually occurs at about the fourth thoracic vertebra. Then, with the catheter in place, a small amount of lipiodol is injected under the flouroscope. It will be seen to outline a blind pouch. One should never use a barium mixture in small infants because they will invariably aspirate some of the material whether or not atresia is present.

Early diagnosis is imperative because of the early development of atelectasis and pulmonary infections. The earlier surgery can be performed the better the chance for survival. The infant should be placed on its abdomen or side in an incubator and given oxygen. Frequent suction of the pharynx is necessary. Nothing is given by mouth. No subcutaneous fluids are necessary for from twenty-four to forty-eight hours and only in moderate amounts after that time. A gastrostomy should not be done prior to closure of the tracheal fistula.

Only an experienced surgeon should undertake the surgery. With modern surgical technics there should be at least a 60 per cent survival rate. This condition is not rare. More than thirty cases a year are seen at The Children's Memorial Hospital.

Congenitally Short Esophagus.—In this condition the esophagus is short and a part of the stomach may be pulled up through the diaphragm with some narrowing in the area of the lower third of the esophagus. Usually there are no symptoms until coarse foods are offered. A swallow of contrast media under the fluoroscope will confirm the diagnosis. Esophageal dilatation is the treatment of choice.

Diaphragmatic Hernia.—In infancy, such malformations are always congenital and most frequently on the left side. They occur through small openings in the sternal, costal and costolumbar portions of the diaphragm. There may be an absence of part of the diaphragm or the upper leaf may be herniated into the chest. The stomach, intestines and even part of the liver may be in the chest cavity.



Fig. 3. Typical x-ray of the abdomen in an infant with duodenal obstruction due to malrotation of the intestines.

There is usually dyspnea and cyanosis soon after birth as air enters the gastrointestinal tract and encroaches upon the lungs. Symptoms of intestinal obstruction may develop early.

On physical examination dyspnea is usually

present with or without cyanosis. The abdomen is scaphoid. The heart is pushed to one side and breath tones are diminished or absent on the affected side. Often bowel sounds and hyperresonance are heard on the involved side.

A roentgenogram usually will establish the diagnosis and contrast media is not necessary.

Treatment is surgical and should be done as early as possible. The mortality is increased by delay in attempts at medical management.

Pyloric Stenosis.—The projectile vomiting of pyloric stenosis not infrequently starts in the first few weeks of life. There is an initial weight gain and then stationary weight or loss of weight. The stools become scanty and green. Vomiting occurs during the feeding or shortly after. Large gastric waves are usually seen. The pyloric tumor in the right upper abdomen can be felt in 99 per cent of the cases and is best felt when the baby vomits after being given some water or formula. Contrast media with fluoroscopy is rarely necessary for diagnosis. When done, there is usually a dilated stomach, delayed emptying time and small squirts of barium passing through the pylorus giving what is called a string sign.



Fig. 4. Typical picture of ileo obstruction in a newborn infant with a typical air pattern and laddering. Operated upon for ileostenosis with recovery.

Treatment is surgical—the earlier the better. When vomiting has been prolonged, the CO_2 of the blood should be checked for an alkalosis due to loss of chloride. If present, normal saline solution should be given intravenously or subcutaneously.

Congenital Malformation of the Intestine.—In atresia of the bowel there is usually an absence of continuity. It is most commonly present in the ileum and less often in the duodenum, jejunum and colon. In stenosis there is partial or complete obstruction, most often of the duodenum and ileum and less often lower down. The malformation occurs during the first trimester of pregnancy. When atresia is present an intra-uterine peritonitis may occur due to rupture of the proximal segment of the gut. As the obstruction is below the ampulla of Vater the vomitus may contain bile. When the obstruction is lower down, the vomitus is brown and resembles intestinal contents. Distention of the abdomen occurs, high up when in the duodenum and generalized when lower down. The stools are scanty in stenosis and may be absent or scanty dry grey in atresia. If microscopic examination of the meconium reveals cornified epithelium then complete obstruction is not present.

Vomiting, loss of weight and dehydration occur early with abdominal distention.

Roentgenogram examination without contrast media is diagnostic in conjunction with the symptoms and physical examination. Films should be taken in the upright and prone positions. Above the obstruction there are fluid levels in the distended loops of bowel. If the obstruction is in the duodenum the stomach and upper portion of the duodenum are distended with air and fluid and there is no air below. If in the jejunum, the distention, air and fluid pattern are usually recognized in the small bowel in the upper portion of the abdomen. If in the ileum, the findings are more generalized throughout the abdomen but often can be identified as in the small bowel. If in the colon, then the air pattern is generalized and at times the colon can be recognized. If the obstruction is near the rectum, the site can be localized by putting a marker over the rectum and taking the film with the infant in the upside down position. There will then be air and a fluid level at the site of obstruction.

Malrotation of the Intestines.—The intestinal tract starts embryologically as a solid tube in which spaces develop in the cell folds until a lumen is established. During this period of rapid growth the small intestine forms coils in the right abdomen and the colon in the left. Then counter clockwise rotation occurs so that the colon rotates over in front of the small intestine and the cecum rotates down to lie in the right iliac fossa. The attachment of the small intestine is maintained to the posterior abdomen by the mesentery. When rotation is not complete, the cecum may lie over the duodenum causing obstruction by pressure or by the development of adhesive bands. Also, when rotation is not complete, the mesentery may remain short so that twisting on its pedicle is possible with the development of a volvulus.

Most duodenal obstructions in the newborn are accompanied by malrotation.

The symptoms and signs are those of high intestinal obstructions previously mentioned. There is vomiting from birth and the vomitus often contains bile. There is high abdominal distention. Roentgenograms in the upright position will give the pieture of high intestinal obstruction.

Treatment is surgical. If the malrotation is not corrected the obstruction may recur. Surgery for the correction of these anomalies formerly gave a high mortality rate but with the advent of the antibiotics recovery ean be expected if a good anastomosis is done. Often when intra-uterine peritonitis is present, although sterile, little ean be done beeause of the massive adhesions.

Duplications of the Gastrointestinal Tract.—Sueh anomalies are rare and may occur from the esophagus downward. Usually they are cystlike tumors that have no direct connection with the viscera, so appear as solid tumors not containing air. If in the chest, they may produce symptoms by encroachment on the pulmonary space. If in



Fig. 5. Infant taken in upside position with mark over rectum giving typical picture of obstruction of the rectal sigmoid portion of the gut.

the abdomen, they may cause pressure on the intestine producing partial obstruction. Correction is by surgery.

Malformation of the Rectum.—Such malformations may be of several types. Early surgery may be required beeause of obstruction.

Type 1. The anus is present but there is stenosis of the anus or just above. Small stools are passed but usually there is abdominal distention. Rectal examination will quickly reveal the anomaly and will at times lead to cure. At other times frequent dilatations are necessary.

Type 2. The anus is imperforated and the bowel ends as a blind pouch a variable distance above.

Type 3. The anus is normally present but there is a stenosis or atresia of the bowel higher up.



Fig. 6. Upright position with agenesis of myenteric plexus with typical air pattern and laddering. Obstruction due to absence of myenteric plexus in colon, no stenosis.

Type 4. The anus dimple is present but the stenosed bowel opens into the perineum anterior to the normal anus.

Type 5. In types 2, 3 and 4 there may be a fistula between the bowel and the bladder, urethra and vagina.

Symptoms are those of lower bowel obstruction with distention, seanty or absent stools, or stools from the urethra or vagina. Roentgenograms are characteristie of low bowel obstruction. If the anus is present, rectal examination will often lead to the diagnosis. If not present, a roentgenogram in the upside down position with a marker over the anal position will reveal an air bubble in the area of obstruction.

In types 2, 3 and 4 surgery is necessary early. One precaution should be emphasized—preserve the anal sphincter. All too often an incision is made blindly into the perineum with resulting injury to the sphincter or the development of a

fistula. There is ample time for a correct diagnosis and correct surgical treatment.

Agenesis of the Myenteric Plexus.—The absence or decrease of sympathetic nerve endings may involve the whole colon or only a part of the colon. There is then a loss of balance between the sympathetic and parasympathetic responses.

When symptoms occur in early infancy the condition is serious. There are absent or scanty stools, vomiting and abdominal distention. A roentgenogram of the abdomen in the upright position is typical of intestinal obstruction. The only differential point may be the passing of a small amount of meconium or air. Rectal examination will usually show the presence of meconium.

When these infants are operated upon no obstruction is found. Upon microscopic examination of the bowel the myenteric plexus is absent or decreased in the contracted portion of the colon and normal in the dilated portion. Medical management is not successful and the mortality is high even with colostomy or ileostomy.

Meconium Ileus.—In this condition the meconium is so thick and tenacious that it is not excreted and causes bowel obstruction. Frequently, these infants are born with a sterile intra-uterine peritonitis due to rupture of the bowel. There will be vomiting, abdominal distention and absent stools. Rectal examination usually will reveal some tenacious meconium. Roentgenograms of the abdomen often reveal the presence of small specklings of calicification as pointed out by Neuhauser.

If rupture of the bowel is present, the condition is usually hopeless because of the adhesions. When not present, it may be possible to wash the tenacious meconium out of the bowel. The prognosis is not good because in nearly all such cases the meconium ileus is one of the manifestation of cystic fibrosis of the pancreas.

707 Fullerton Avenue.

ORAL CHOLECYSTOGRAPHY

EXPERIENCES WITH THE NEWER CHOLECYSTOPAQUES

WENDELL G. SCOTT, M.D.
ST. LOUIS
AND
W. A. SIMRIL, M.D.
ST. LOUIS

At the present time, two of the newer radio-opaque contrast media are in use for oral cholecystography and a third is in the process of being tried. The two compounds now available are iodoalphionic acid (Priodax*) and 2-(4-hydroxy-3,5-diiodo-benzyl)-cyclohexane carboxylic acid (Monophen**). The third and latest cholecystopaque is 3-(3-amino-2,4,6-triiodophenyl)-2-ethyl propanoic acid (1,2) (Telepaque***). The purpose of this discussion is to relate experiences in using these substances for oral cholecystography. The chemical formula for each of these compounds is shown in figure 1.

Iodoalphionic acid, introduced in 1942, is the most commonly used of the newer oral cholecystographic media. It contains 51.38 per cent iodine. It is usually given during the evening meal on the night preceding the radiographic examination the following morning. The tablets are swallowed at five minute intervals during the evening meal which should be devoid of fatty foods. No food or drink is permitted after taking the tablets other than a few swallows of water or fruit juice and breakfast is omitted on the following morning.

Unfavorable side effects following the oral administration of this compound occur infrequently and consist of nausea, mild diarrhea and, rarely, vomiting. Few patients have complained of a dryness of the mouth, urticaria or dysuria. In our experience these symptoms have never been of sufficient severity to interfere with the usual routine of the patient. The acceptance of iodoalphionic acid has greatly simplified the technic of oral cholecystography and, except in rare instances, has proved to be quite satisfactory.

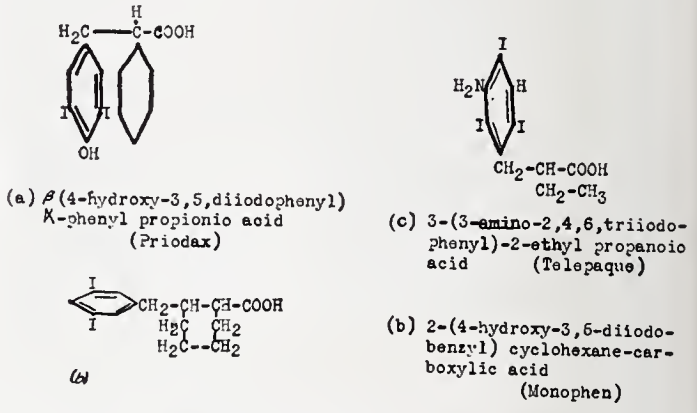


Fig. 1. Chemical structure of the newer cholecystopaques.

The second of the newer oral cholecystographic media, a cyclohexane carboxylic acid compound, is also a synthesized compound, introduced in 1944, but differs from the first cholecystopaque in containing only one phenyl group. It contains 52.2 per cent iodine and is a crystalline white powder, soluble in alkali and alcohol but insoluble in water. Epstein, Kramer, Cohen and Natelson[1, 2] have reported that it is well tolerated and that side effects of abdominal cramps and nausea are infrequent and diarrhea, vomiting and dysuria are rare. These unfavorable side effects are similar to and about as infrequent as those seen following iodoalphionic acid. The drug is eliminated mainly via the kidneys, 95 per cent being excreted in forty-eight hours—a somewhat more rapid rate of excretion

* Schering Corporation, Bloomfield, New Jersey.
** National Synthetics, Inc., 270 Lafayette Street, New York 12, N. Y.
*** Winthrop-Stearns, Inc., 170 Varick Street, New York 13, N. Y.

than the other media. These workers recommend this compound as an acceptable cholecystographic medium from experience in more than two thousand cases. In our experience it has been satisfactory. It is supplied in 0.5 gram capsules and is given in a dose of from six to eight capsules in the usual manner. The capsules are large and are of sufficient size that many patients find them difficult to swallow.

The ethyl propanoic acid compound,* the newest

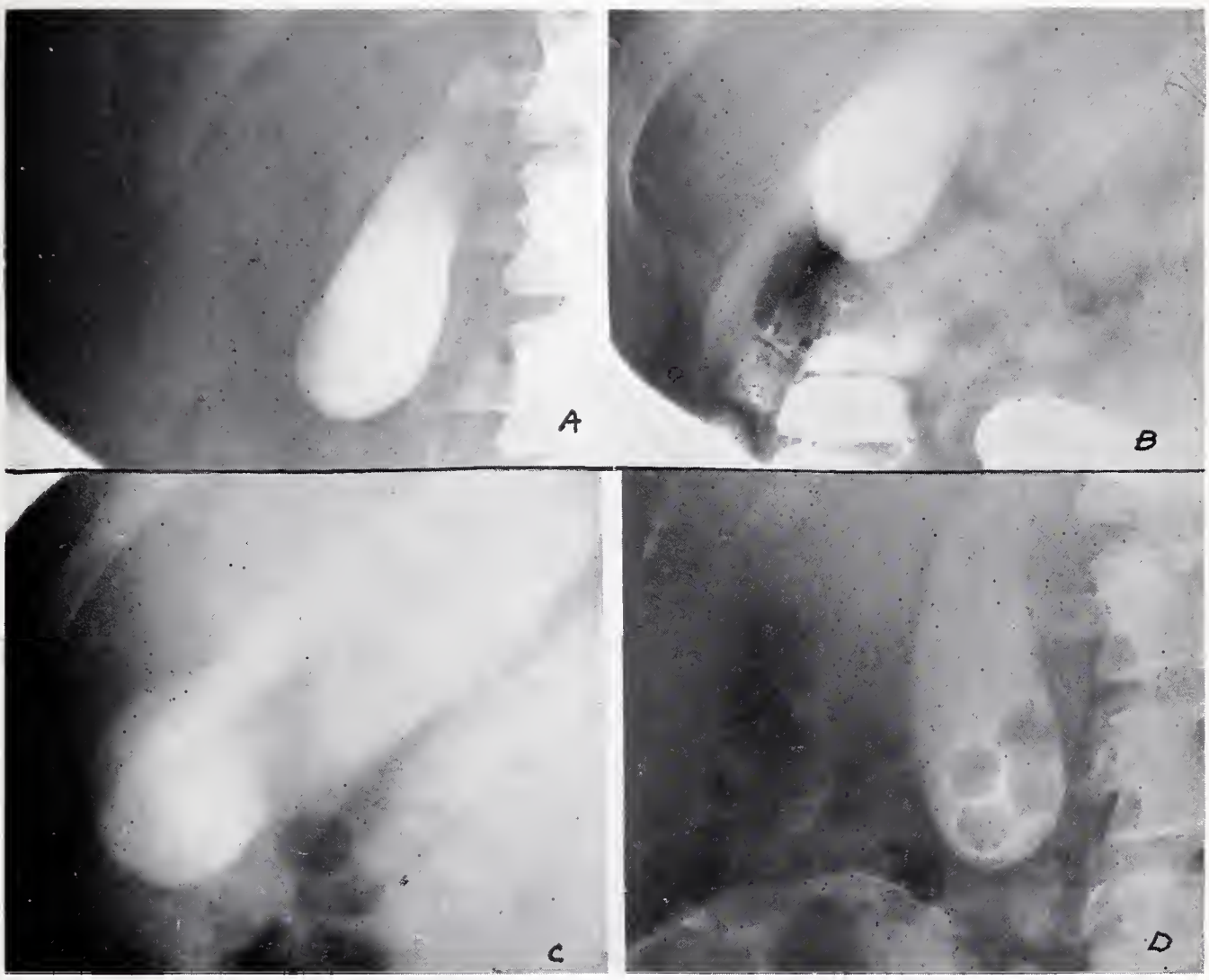


Fig. 2. Examples of oral cholecystograms made using the ethyl propanoic acid compound.
(A) Routine fifteen hour cholecystogram showing a slightly greater density than is usually seen with other cholecystopaques.
(B) Four and one half hour cholecystogram on a hypersthenic patient demonstrating the speed of absorption and concentration of this compound. Tablets were given following the barium meal.
(C) Four hour cholecystogram in an obese woman weighing 197 pounds. Tablets given following the barium meal.
(D) Oral cholecystography at fifteen hours demonstrating two "negative" stones in addition to two "mixed" stones. The "negative" stones were not seen previously because of non-visualization following iodoalphionic acid.

of the synthetic organic iodine containing compounds for use in oral cholecystography, was introduced late in 1950. Like the cyclohexane carboxylic acid compound, it also has only one phenyl group; but contains 66.68 per cent iodine or 15 per cent more iodine than the others by virtue of its triple iodine radicals. The manufacturers have submitted laboratory data describing properties and chemical structure of the ethyl propanoic acid compound. It is a cream colored solid, insoluble in water but soluble in dilute alkali and 95 per cent alcohol as well as other organic solvents. It has been tried experimentally in mice, cats and dogs and is reported only one third as toxic as iodoalphionic acid. No hepatic or renal impairment resulted from a total of 1,000 milligrams per kilogram of body weight in divided doses of 500 milligrams per kilogram when fed to dogs. Also, when a total of 3,000 milligrams per kilogram of body weight in divided doses of 1,000 milligrams per kilogram was fed to dogs, no physiologic, gross or microscopic renal or hepatic damage could be demonstrated. These doses far exceed the amounts used clinically (30 to 50 milligrams per kilogram of body weight) indicating a relatively low toxicity.

* Telepaque for this study supplied by Medical Research Dept., Winthrop-Stearns Inc., 1450 Broadway, New York 18, N. Y.

The speed with which the gallbladder can be visualized and the degree of density obtained were compared in animals and the ethyl propanoic acid compound was found to be superior to the other cholecystographic media in both respects. This is probably explained by the higher iodine content of this compound. More detailed reports of animal studies on the toxicity, radio-opacity, physiologic effects, kidney and liver function tests and pathologic observations are available.[3] This compound is supplied in tubes of six tablets, each tablet containing 0.5 grams, or 3.0 grams as the average dosage. The tablets are white and about the size and appearance of aspirin tablets, a factor appreciated by the patient.

We have used this newest of the cholecystopaques in sixty-five unselected cases with excellent results and no unfavorable reactions. Fifty of these cases were examined in the routine manner with films exposed at thirteen to fifteen hours after ingestion of the tablets. Of the fifty cases, two were diagnosed as "nonvisualization" and seven were diagnosed "cholelithiasis." Gallbladder shadows were obtained in several cases which were not visualized on previous occasions when iodoalphionic acid had been used. Fifteen cases were examined from four to six hours after ingestion of the ethyl propanoic acid compound to determine the speed of gallbladder visualization by this compound. Only one case was a failure in that the gallbladder shadow was not sufficiently dense to warrant accurate diagnosis. All the remaining cases had gallbladder shadows of excellent quality. A similar test was conducted using iodoalphionic acid in fifteen cases. Gallbladder shadows of adequate density were obtained in six cases. In nine of them the gallbladder shadows were of insufficient density or were not visualized.

In figure 2 are examples of oral cholecystograms made after the ingestion of three grams of the ethyl propanoic acid compound. (A) is a routine fifteen hour film made on a 39 year old woman of medium size. The gallbladder density is of excellent quality and is more dense than usually seen following the use of other cholecystopaque compounds. (B) is the oral cholecystogram on a 48 year old man of large stature and hypersthenic habitus. This film was obtained four and one half hours after the six tablets were ingested following the barium meal for an upper gastrointestinal series. It demonstrates the rapid absorption that occurs with this compound and the speed with which concentration takes place in the gallbladder. (C) represents an oral cholecystogram made on a 37 year old woman weighing 197 pounds. The film was taken four hours after ingestion of the ethyl-propanoic acid compound following the barium meal. The density of the gallbladder is excellent even in this obese patient after this short period of absorption and concentration. This rapid technic of oral cholecystography is not recommended as a routine procedure, but in certain emergencies it can be performed with assurance of accurate diagnosis when an adequate shadow such as this is obtained. (D) is a film on a 42 year old woman taken at fifteen hours after taking the tablets. Two months prior to this examination, oral cholecystograms were made with the iodoalphionic acid compound and were reported as showing two gallstones surrounded by opaque rings of calcifica-

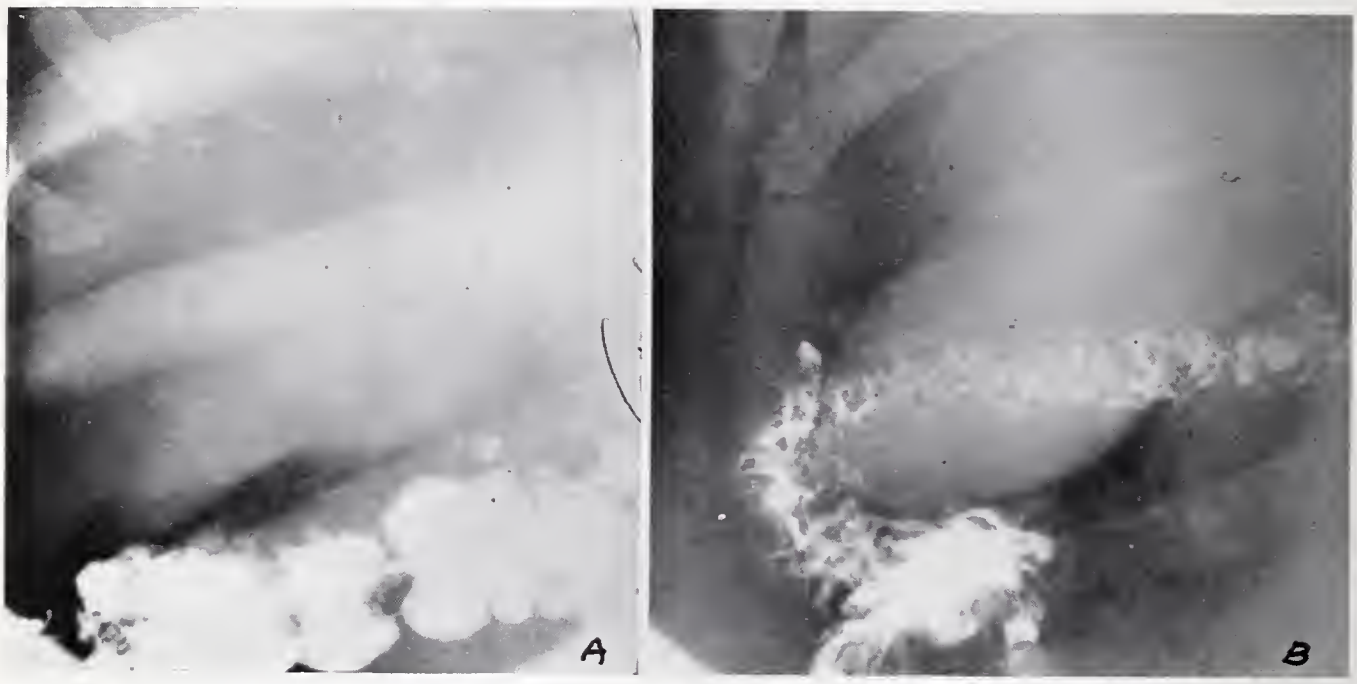


Fig. 3 (A) Routine fifteen hour cholecystogram following a single dose of iodoalphionic acid in a grossly obese patient. The gallbladder is not visualized.
(B) Routine film following single dose of ethyl propanoic acid compound to the same patient. The gallbladder shadow is clearly visualized.

tion and nonvisualization of the gallbladder. The examination shown in (D) reveals a definitely lesser degree of density than would be seen in a normal gallbladder, but the gallbladder is of sufficient density to demonstrate two additional negative stones that had not been shown on the previous examination.

There seems little doubt but that the ethyl propanoic acid compound, with its greater iodine content, is of definite value in the cholecystographic examination of large patients or in those in whom previous examinations have revealed nonvisualization of the gallbladder or gallbladder shadows of inadequate density. This observation is illustrated in figure 3. (A) represents the cholecystogram made on a large man weighing well over 200 pounds. This film was made fifteen hours after a single dose of iodoalphionic acid and reveals no recognizable gallbladder shadow. (B) represents the cholecystogram obtained fifteen hours after



Fig. 4. Routine fifteen hour cholecystogram following use of the ethyl propanoic acid compound. The small "negative" stones are not obscured by the density of the gallbladder shadow.

ingestion of a single 3 gram dose of the ethyl propanoic acid compound. Interestingly enough, a report of nonvisualization had been made on this patient several years previously after a double dose of iodoalphionic acid.

Figure 4 is inserted for the purpose of illustrating a dense gallbladder shadow in a 20 year old woman of average size in which multiple small negative stones are clearly visualized. This demonstrates that small negative stones and filling defects are not obscured by the increased density of the gall-

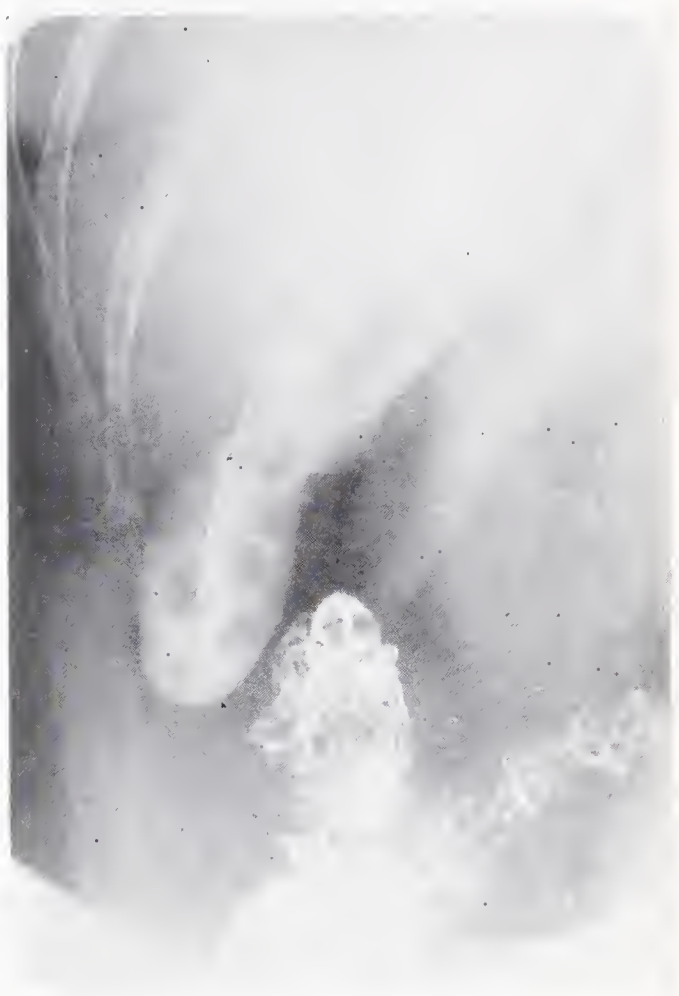


Fig. 5. Routine fifteen hour cholecystogram following use of four tablets of the ethyl propanoic acid compound in a middle aged woman with multiple negative gallstones. This patient weighed 165 pounds.

bladder shadow obtained by using the new ethyl propanoic acid compound.

Further study of a series of twenty-five cases was made to test the feasibility of using only four tablets (2 grams) of the ethyl propanoic acid compound as a routine method. The patients varied in weight from 92 to 165 pounds. Of these patients nine had a pathologic gallbladder, of which six contained negative stones and three were not visualized. The remaining sixteen patients were normal. Figure 5 is inserted as an example of the density of the gallbladder shadow obtained with four tablets of the ethyl propanoic acid compound in a middle aged woman patient weighing 165 pounds. Multiple negative gallstones are well demonstrated.

Shadows of excellent density were obtained in all patients weighing less than 125 pounds and adequate shadows in those weighing up to 165 pounds. It is felt that four tablets of the ethyl propanoic acid compound are a sufficient dose for all patients

under 150 pounds. The chances of error are greater with faint and unsatisfactory densities than with the possibility of an excessive density with consequent masking of small gallstones. The larger dose of 3.0 grams (6 tablets) is recommended in large or heavy patients and in those who have been previously examined by other cholecystopaques with unsatisfactory shadows.

CONCLUSIONS

Three of the newer cholecystographic media for oral use, including iodoalphionic acid, a cyclohexane carboxylic acid compound, and an ethyl propanoic acid compound have made oral cholecystography a simple, convenient and accurate test of gallbladder function and pathologic status. Of these compounds, the new ethyl propanoic acid compound produces cholecystograms of greater density, after a shorter interval, in a larger percentage of patients than the other cholecystopaques. It is also recommended in a reduced dosage of four tablets for patients weighing 150 pounds and less. In addition, it causes fewer unfavorable side reactions and is dispensed in tablets of a size convenient for the patients to swallow.

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ROENTGEN THERAPY IN BURSITIS OF THE SHOULDER

AN ANALYSIS OF FIFTY CASES USING BOTH DEEP AND SUPERFICIAL TECHNIQUES

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ST. LOUIS
AND
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INTRODUCTION

The disease bursitis of the shoulder has been recognized for at least the last half century. It has not always been recognized by that name. The complex and often confusing synonyms which have been used to describe the symptoms of acute or chronic pain in the shoulder, with or without the associated calcifications, and the development of the so-called "frozen shoulder," have given rise to much confusion.

Among the most commonly used words are Duplay's disease, subacromial or subdeltoid bursitis, peritendinitis calcarea and para-arthritis.[1, 2] Essentially, all refer to the same clinical entity. For purposes of clarity in this presentation, the words "subacromial bursitis" will be used since it seems to be the most commonly employed.

ANATOMY

There are no less than six bursae commonly found around the shoulder joint.[3] The largest and most usually affected is the subacromial or subdeltoid bursa, which lies between the tendons of the muscles inserting onto the greater tuberosity, and the inferior surface of the acromium process and the deltoid muscle. This sac is typical of the bursae synoviae, which are fluid filled sacs lying between muscles and tendons. Like others of its class, it is at or near a joint and communicates with the joint space, in this case the shoulder joint. Others of the bursae about the shoulder joint are bursae mucosae, which are in the subcutaneous tissue, usually between a bone and the skin surface, an example of which is the prepatellar bursa.[4] The purpose of the subacromial bursa, like that of all bursae of its type, is to provide a sliding cushion between the overlying deltoid muscle and the firm tendons beneath. In the normal state the smooth lining and small fluid content provide just such a cushion.

ETIOLOGY AND PATHOLOGY

The exact etiology of this disease is not known. Steen and McCullough, in their series of 300 consecutive cases, state that the consensus is that the lesion starts as a degenerative process in



Fig. 1. Subacromial bursitis, chronic, with small irregular calcification.

the tendon.[5] Present knowledge would tend to indicate that it is a degenerative process which becomes inflamed, possibly as the result of repeated or unusual trauma, possibly from other poorly understood processes, producing the symptoms with which one is familiar. The work of

Caldwell and Unkauf states that the process starts as a degeneration in the tendons, in which there is calcium deposition, and that this ruptures into the bursa.[6] This theory that tension of the contents of the bursa produces the pain is held by many. Sandstrom found that the calcification was not free in the bursa but in the wall of the bursa, in the tendons and in the joint capsule.[7] All of

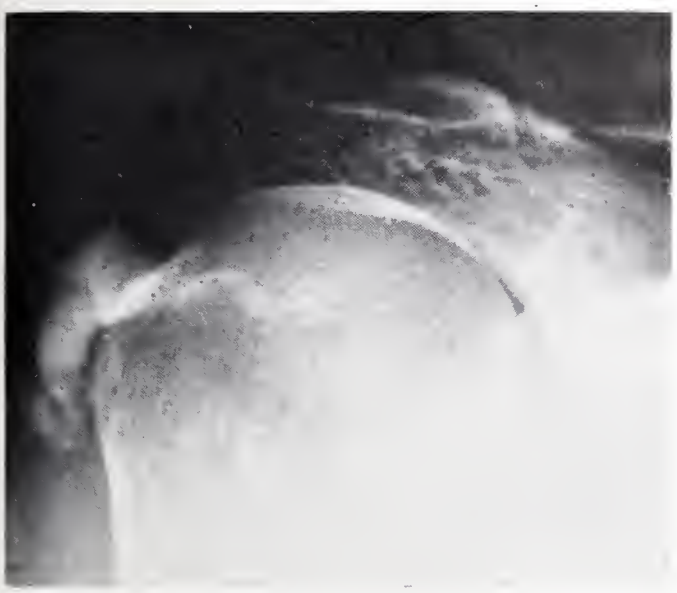


Fig. 2. Subacromial bursitis, chronic, with acute recent clinical course. Large nodular calcification in the bursa.

the structures showed degenerative changes. Added to these changes were those of acute inflammation. These findings would tend to substantiate that the acute clinical stage is superimposed upon preexisting degenerative process.

These latter conclusions strengthen the use of such terms as "peritendinitis calcarea" as recommended by Klein[8] or "para-arthritis" as stressed by deLorimer.[2] By the use of these terms many similar soft tissue calcifications such as DeQuervain's disease, tendinitis of the thumb with calcification[9] and the similar calcifications in soft tissue, in which there is no clear cut bursa, but which present symptoms of "bursitis," might be included. Such terminology would also fit the tendon-bursa inflammations of "tennis elbow" and "housemaid's knee." All have similar pathologic pictures.

Direct trauma, which often has been related to subacromial bursitis, has not been conclusively proven as an etiologic agent. Disturbance in calcium metabolism also has been considered. However, the fact that the symptoms often occur in the absence of demonstrable calcifications and with no other laboratory findings fail to substantiate this contention.

DIAGNOSIS

The diagnosis of subacromial bursitis is most often made clinically. The symptoms are primarily those of pain in the shoulder. The initial limitation of motion is usually due to this pain. The pain is not entirely characteristic, but usually has a point of most pronounced tenderness just lateral to the distal end of the acromium. Occasional cases display in addition to the point of principal pain a rather bizarre distribution with pain referred to the arm, hand, breast or beneath the shoulder blade. Insomnia due to the pain is quite common. Roentgenograms of the shoulder are always of value in that the finding of calcium in or near the bursa aids in substantiating the diagnosis. Views with the arm in external and internal rotation are necessary since small calcifications may be obscured in one of the views and clearly demonstrated in the other (figures 1 through 5).

The differential diagnosis should exclude fracture, neoplasms (either primary or metastatic), acute infections, herpes, calcinosis universalis, angina, neuralgia, cervical rib (or scalenus syndrome), tuberculosis or apical pulmonary tumor. It is primarily to rule out these that roentgenograms are of value.

MATERIAL FOR STUDY

This paper presents the results of fifty consecutive cases of subacromial bursitis. All of the patients represented here are those in whom adequate statistical data was available to evaluate the immediate response to roentgen therapy. Efforts were made to evaluate only the degree of relief of pain since this was the primary aim of treatment. All were patients referred to us, as radiologists, for treatment, and all were treated

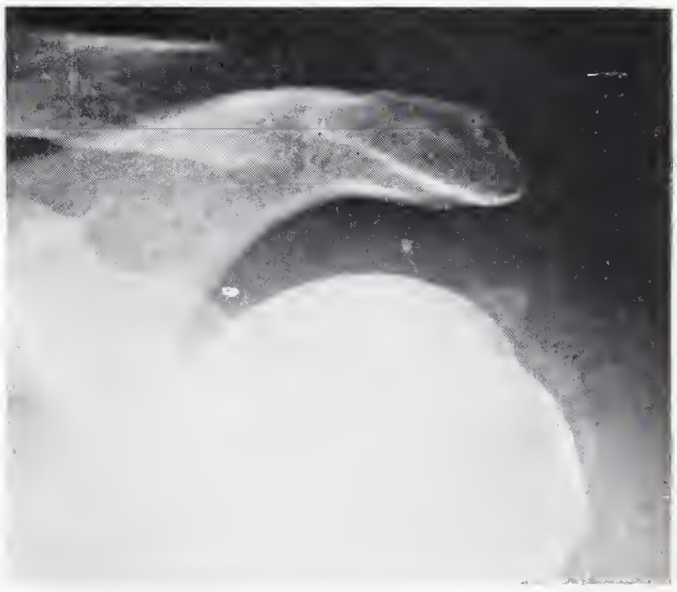


Fig. 3. Subacromial bursitis with numerous faint calcifications. This case was of only three weeks' duration with acute clinical course.

as outpatients. The patients then returned to the referring physician for follow-up care if any was needed. Roentgenograms were not available on some of the patients, having been taken else-

where. Nearby all of those x-rayed by us showed calcifications.

Of the patients studied, twenty-seven (54 per cent) were female and twenty-three (46 per cent) were male. The ages varied from 19 (a male with bilateral involvement) to 70 years. The average age of this group was 47.5 years. This is somewhat younger than age groups reported by clinics. Of

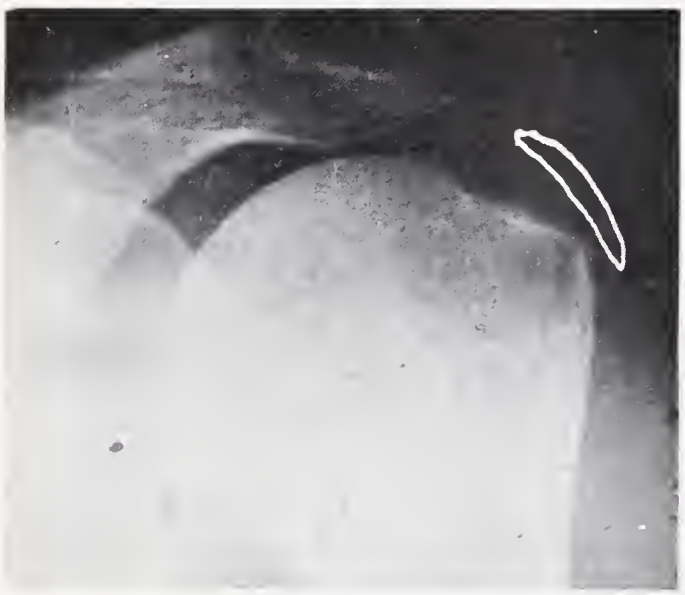


Fig. 4. Subacromial bursitis, acute, with faint calicifications (circled) on the external rotation film. This is obscured in figure 5.

these patients, thirty-two (64 per cent) had right shoulder disease, sixteen (32 per cent) had left shoulder and two (4 per cent) had bilateral involvement. In all cases roentgen therapy was the primary treatment method.

The cases were divided into acute and chronic disease. The acute cases were those in whom the symptoms were severe and of less than one month's duration. Almost all of these were of less than two weeks' duration. Chronic cases were those whose symptoms had persisted for more than one month. Many of these presented symptoms varying in degree over periods of several years. Of this group, seventeen (34 per cent) were classified as acute and thirty-three (66 per cent) as chronic.

ROENTGEN THERAPY IN SUBACROMIAL BURSITIS

Many forms of therapy have been used in the treatment of bursitis. These include procaine injection,[10] physiotherapy in many forms and even a variety of drugs including neostigmine.[11] Some authors have stressed physiotherapy during roentgen therapy, to include manipulation under anesthesia, or to follow the relief of the initial pain by roentgen therapy or by other means, with physiotherapy.[12, 13]

Roentgen therapy has long been recognized as a valuable method in the treatment of bursitis.[1, 2, 5, 6, 7, 8, 12, 14, 15] While the exact method by which this agent works has never been accurately determined, certain effects produced by irradiation on living tissues are known to exist. These include the production of an active hyperemia in the tissues with dilatation of the blood vessels and consequent improvement of the blood flow. This aids in reducing the edema and pressure on nerve endings which is thought to be the cause of the pain. This action also acts to remove toxins which may be present. The destruction of leukocytes with liberation of their antibodies aids in clearing up the inflammatory process. In so far as the calcium is concerned, the roentgen therapy does not remove it primarily but may aid this removal secondarily by the production of hyperemia. Resorption was not checked upon by follow-up films in this series.

Therapy was divided into two groups according to one of two methods employed. One group received deep roentgen therapy (200 K.V., 15 Ma., 1 mm. of Cu. and 1 mm. of Al. filtration); the other superficial therapy (100 K.V., 5 Ma., 1-3 mm. of Al. filtration). The portal size varied from 100 to 225 sq. cm. area, the only consideration being that adequate area to cover the entire lesion was provided. The treatment schedule was variable. Three treatments of from 75 to 150 r were usually given in the first week with additional treatments up to a maximum total of six given at weekly intervals. Thirty-seven patients received deep therapy while thirteen received superficial therapy. Each patient received an average of 3.7 treatments. The deep therapy group received 3.8

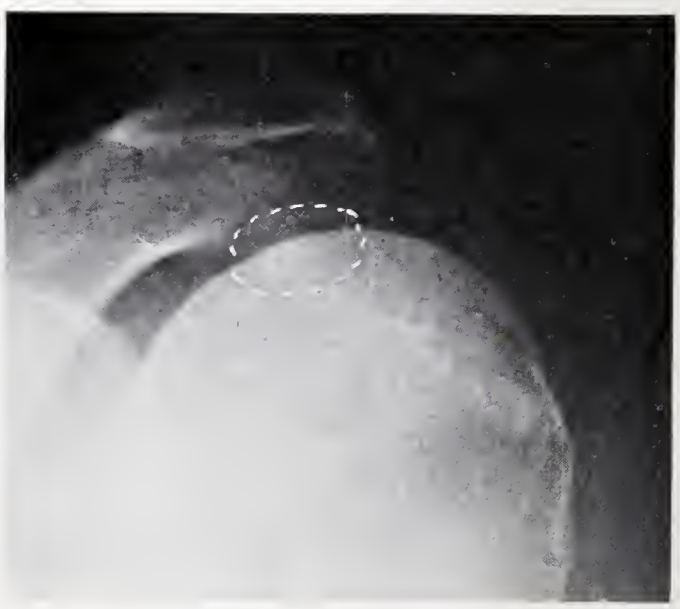


Fig. 5. Faint calcifications seen in figure 4 are obscured by the head of the humerus and the acromium. This case illustrates the value of two views in making a differential diagnosis.

treatments; the superficial group, 3.3. The total average dosage was 389 r; the deep therapy group receiving 402 r, the superficial, 343 r.

It was felt that if no relief of pain was obtained

Table 1. *Treatment Results*

	Prompt and/or pronounced relief of pain		Late and/or partial relief of pain		No relief of pain	
	Acute	Chronic	Acute	Chronic	Acute	Chronic
Deep Therapy	9 (81.8%)	14 (49.0%)	1 (9.1%)	7 (24.5%)	1 (9.1%)	5 (17.5%)
Superficial Therapy	6 (100%)	5 (71.5%)	0	0	0	2 (28.6%)
Total	15 (88.4%)	19 (62.7%)	1 (5.8%)	7 (23.1%)	1 (5.8%)	7 (23.1%)
Percentage	68% (34)		16% (8)		16% (8)	
Total Satisfactory results 84% (42)			Failure 16% (8)			

after four or five treatments, no benefit was to be expected and other methods were recommended. Often the patient was free from pain after the initial treatment, frequently after the first two.

ANALYSIS OF TREATMENT RESULTS

The results were tabulated according to the response to treatment. If relief of pain was prompt or pronounced at the end of two or three treatments, or if relief was moderate and obtained after three or more treatments, the response was considered satisfactory. Those patients who received no relief of pain were considered treatment failures. No patient was made worse by the therapy, although frequently there was an exacerbation of pain, transient in character, for six to twelve hours following the initial dose. In all patients with such a finding, the treatment was followed by prompt relief of pain. The following table gives the results which were obtained.

CONCLUSIONS

1. Roentgen therapy is of value in producing relief of pain in both acute and chronic subacromial bursitis.

2. This therapy is more effective in acute bursitis than in chronic disease. Of the former, 96.2 per cent obtained good results; of the latter, only 85.8 per cent. There were many more treatment failures in the chronic group.

3. There would appear to be little significant difference in the use of deep and superficial roentgen therapy, provided adequate penetration is used to reach the site of the disease.

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STRANGULATED FEMORAL HERNIA

A REVIEW OF ONE HUNDRED EIGHT CASES

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ST. LOUIS

CLINICAL MANIFESTATIONS, DIAGNOSIS AND TREATMENT

HERNIAS in the femoral region have attracted considerable attention in the literature, chiefly because of the great frequency with which incarceration and strangulation occur, and it has been estimated[1] that such accidents take place in approximately 9.0 per cent of all femoral hernias. In reviewing the reports of various institutions[2-10] the frequency with which femoral hernias are found strangulated at admission to the hospital varies from a low figure of 8.9 per cent[7] to a high of 33.0 per cent.[4] Even so, it was somewhat surprising to find in reviewing all femoral hernia cases admitted to St. Louis City Hospital during a fourteen year period, from 1936 to 1949, that operation had been performed more often for strangulated hernias than for uncomplicated and incarcerated femoral hernias combined. There were 108 strangulated femoral hernia cases admitted, of which 101 received surgical treatment, while 73 of 95 nonstrangulated femoral hernias were op-

From the Surgical Service of the St. Louis City Hospital, St. Louis, Missouri.

erated upon. This situation, in large part, is due to the type of patient seen at this hospital, one reluctant to seek or accept medical aid until serious complications arise, and perhaps is due partly to failure of the physician to recommend operation in uncomplicated femoral hernia.

Analyses of large series of cases are available in the literature which competently present the clinical behavior of strangulated femoral hernias. The particular purpose of this paper is to emphasize the clinical findings associated with various sac contents, certain aids to diagnosis, factors influencing the operative mortality and methods of surgical treatment.

TABLE 1. *Contents of Hernial Sac in 101 Cases of Strangulated Femoral Hernia*

Contents	All Cases	Cases with Gangrene (Total 42, 41.6%)
Small Bowel	89	35 (39.4%)
Alone	52	21 (40.4%)
With Omentum	34	13 (38.2%) 5 with gangrene of omentum also
With Appendix	2	1
With Bladder	1	0
Omentum	43	11 (25.2%)
Alone	9	2 (22.2%)
With Small Bowel	34	9 (26.4%) 5 with gangrene of small bowel
Large Bowel Only	2	0
Appendix and Caecum	1	1

Contents of the Hernial Sac

As noted in table 1, the most common abdominal organ found in the hernial sac is small bowel, usually ileum. This is in accord with other series of cases.[3, 8, 11, 12, 13] Omentum is found next most often and frequently in association with small bowel. While it has been reported[5, 13] that the incidence of gangrene of the small bowel is less when omentum is also present in the sac, such was not the case in this series.

Rarely one may encounter two loops of small bowel within a strangulated hernia in which case one must suspect gangrene of the intervening loop of small intestine concealed within the abdomen. Watson[14] described this condition and gave several references.[15, 16, 17] In 1910, Laroyenne[16] reported two cases of "retrograde strangulation" (also called hernia in "W" or Maydl's hernia) of inguinal hernias with ileum and cecum in one and two loops of small intestine in the other. In each instance the intervening bowel was strangulated but viable. This author states that about fifty cases had been reported up to 1910. Frankau mentions four instances of retrograde strangulation in 654 collected cases of strangulated inguinal hernia.

In the series being reported the case of a 64 year old woman with symptoms of two weeks' duration probably represents a strangulation of this type for, although only a single viable loop was found in the sac at the time of operation, the sac was incompletely filled and, at postmortem examination, a gangrenous loop of bowel adjacent to the viable bowel was found within the abdomen. It is assumed that the gangrenous loop of bowel receded within the abdomen prior to operation.

Dean[8] called attention to another possible cause of gangrene of an intra-abdominal loop, namely, an extension of the thrombotic process from the vessels of the herniated intestine into the mesenteric vessels of the nonherniated intestine. Probably such a process could follow an operative resection and anastomosis also. In one fatality in this series following an apparently adequate resection of gangrenous small intestine, gangrene of a portion of ileum distal to the anastomosis was found at postmortem ten days after operation.

Sex, Side, Age, and Duration of Hernia

There were sixty-nine females and thirty-two males in the series, a distribution similar to previous reports.[2, 3, 5, 12, 13] Gangrene of some structure was found in 37.7 per cent of females and 50.0 per cent of males, while gangrene of the small bowel, when present in the sac, occurred in 37.7 per cent of females and in 42.8 per cent of males.

Just as uncomplicated femoral hernia is more common on the right side, strangulated femoral hernia is also more common on that side, and in this series the right sided preponderance is somewhat more pronounced in the strangulated hernias. There were sixty-four right sided strangulated femoral hernias and thirty-six on the left side with one bilateral. The ratio then of right to left is close to 2:1 (table 2). Approximately the same proportions are found in both sexes. It is interesting to note that of the nongangrenous strangulated hernias containing small bowel, the ratio of right to left is almost 1:1, but gangrene of the small bowel is found four times more often on the right side than on the left side. Thus, right sided hernias with small bowel present had gangrenous bowel in 50.0 per cent of cases; on the left the incidence was only 21.9 per cent. This characteristic is found in both sexes.

In one patient a bilateral strangulated femoral hernia occurred; unfortunately only one side was recognized and operated upon and the strangulated hernia on the opposite side was identified only at autopsy. Jones[18] has reported a case of bilateral strangulated femoral hernia who survived operation.

TABLE 2. *Side of Hernia and Incidence of Gangrene*

Side	Cases	Viable Contents		Gangrenous Contents		Per Cent Gangrene	
			Small Bowel		Small Bowel		Small Bowel
		All	Only	All	Only	All	Only
Right	64	32	28	32	28	50.0	50.0
Left	36	26	25	10	7	27.8	21.9
Bilateral	1						

There was one woman in this series who was first treated for an acutely incarcerated right femoral hernia containing small bowel thirteen years before her admission for a strangulated left femoral hernia. In two cases in which repair of the hernia was not done at the time of operation for strangulation, a second strangulation of the same hernia occurred, one after a seven year interval and one three months after the first operation.

The average age of the patients in this series was 63.0 years, and in 70.3 per cent of the patients the age was between 50 and 79 years (fig. 1). The youngest patient was 6 years old, the oldest 93. Gangrene in patients less than 50 years of age occurred in 27.8 per cent and in 44.6 per cent of those 50 years or more. The average age of patients with omentum only within the hernial sac was 53.6 years, nine years less than the average of the entire group.

In 16.2 per cent of the patients strangulation of the hernia was the first indication of any abnormality, approximately the same incidence recorded by Frankau.[13] Of the remainder, the average known duration of the hernia was 12.0 years with a slightly longer duration in males than females. The duration of the hernia showed little variation with the different sac contents.

The average age at which the patient became aware of a hernia, exclusive of those patients in whom strangulation was the first symptom, was

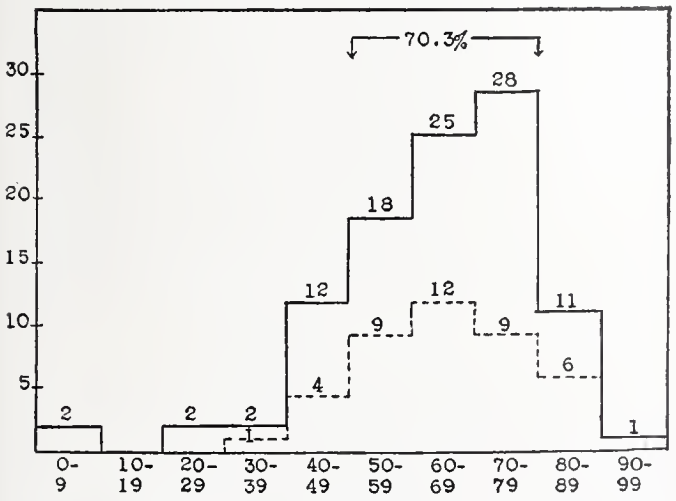


Fig. 1. Distribution by age of all cases and those with gangrene. Solid line represents all cases and dotted line those with gangrene.

49.9 years. Males were apparently aware of a hernia at an earlier age than females which may be partially a reflection of the greater frequency of careful medical examination of this region in the male.

Symptoms and Signs; Clinical History

The symptoms of which the patient complains and the signs he presents vary with the contents of the hernial sac and the presence or absence of gangrene. Thus, while the important consideration is a correct diagnosis and prompt operation, a careful evaluation of the clinical history and findings may be helpful in predicting the probable character of the hernial sac contents. Some of the more common clinical findings and those found to be of greatest differential value are listed in table 3.

The usual history is that of sudden onset of pain, perhaps first noted in the region of a previously

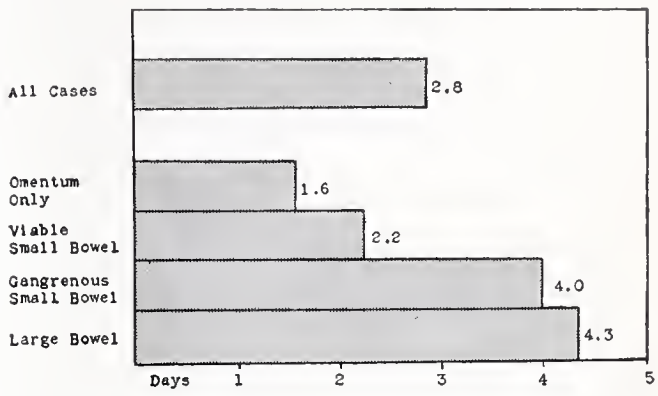


Fig. 2. Average duration of symptoms with various sac contents.

reducible hernia which the patient now finds has become firm and irreducible. Poorly localized abdominal pain ensues or is present at the onset, and this pain becomes cramping in character. It is noted that either abdominal pain or pain in the hernia or both was present in all but three cases. Vomiting usually occurs early, and the character of the vomiting may gradually become feculent if treatment is delayed. Bowel movements cease as well as the passage of gas unless the obstruction is incomplete, and the patient may resort to cathartics and enemata. The most important physical finding is the mass in the femoral region which the examiner recognizes or suspects is an incarcerated hernia.

The onset of incarceration in this series was occasioned by increased exertion of some sort such

TABLE 3. *Incidence of Certain Clinical Findings of Differential Value*

Findings	Incidence Per cent	
Pain all types	97.0	
Abdominal		87.2
In Hernia		76.1
Vomiting	89.1	
Tenderness of hernia	72.2	
Obstipation	68.9	
Borborygmus	67.5	
Discoloration of hernia	23.8	
Acetonuria	24.0	

as lifting, straining, coughing or vomiting in 52.1 per cent of cases in which this information was available. In 20.8 per cent of cases the incarceration occurred while eating or shortly thereafter. In a large number of cases no unusual effort was present at the onset, and many times the patient was lying in bed or sitting in a chair.

As one would expect, the sac contents and their

state of viability will in some measure be reflected in the duration of symptoms (fig. 2). However, gangrene may take place early, perhaps depending on a constriction which rapidly overcomes arterial blood pressure. There was one case in this series with gangrene of the small bowel with symptoms of only six hours' duration. The duration of symptoms was less than twenty-four hours in only one other of thirty-five total cases of gangrene of the small bowel. In patients less than 50 years of age the average duration of symptoms was only 1.2 days with gangrene of the small bowel in 21.2 per cent, and in those more than 50 years of age the average duration of symptoms was 3.1 days and gangrene of the small bowel occurred in 42.7 per cent. Finally it was observed that in those instances in which strangulation of the hernia was the first abnormality noted by the patient, the average duration of symptoms was approximately 1.6 days longer than in those who were previously aware of a hernia.

TABLE 4. *Differential Findings of Gangrene*

Findings	Incidence (Per Cent)		
	All Cases	Viable Contents	Gangrenous Contents
Discoloration of hernia	23.8	6.8	47.7
Fecal vomiting, when small bowel in sac	43.4	20.5	60.0
Temperature of 100.0° F. or over	14.1	6.9	24.4
Acetonuria, when small bowel in sac	27.0	22.2	35.3
Tenderness of hernia	72.2	67.9	78.3

Clinical findings particularly suggestive of gangrenous hernial sac contents were found to be external discoloration of the hernia and fecal vomiting (table 4). The latter occurred only when small bowel was incarcerated. However, gangrene of the omentum was accompanied by discoloration as often as gangrene of the bowel, so discoloration may be considered suggestive evidence of gangrene regardless of sac contents. Temperatures of 100.0 F. or more suggest gangrene, but such elevations do not occur in most of the cases, and the average temperatures in cases with or without gangrene do not vary significantly from the average of all cases, which was 98.9 F. The highest recorded temperature in the entire series was 101.5 F. The presence of tenderness of the hernia to palpation and acetonuria are of much less differential value in estimating viability.

The symptoms and signs of strangulated femoral hernia which contain omentum only are quite different than those when small bowel is present (table 5). Pain in the hernia was described by the patient in all cases in which omentum was the only constituent of the sac, and the incidence of abdominal pain, vomiting, borborygmus and obstipation (indeed the signs of intestinal obstruction) are markedly reduced. Fecal vomiting and acetonuria did not occur when small bowel was not present in the sac.

The average pulse rate was 92 and there was no significant variation whether gangrene was present or not. The average size of the herniated mass was 6.1 cm. which also did not vary significantly with the contents of the hernial sac or the state of viability. The white blood cell count varied from normal values to a high of 33,000, but little reliance can be placed on this determination as a diagnostic or differential aid.

Previous episodes of incarceration occurred in 24.8 per cent of these patients, and certainly might have been taken as an indication of future difficulty. In some instances medical consultation advising surgical repair was refused; usually the situation was ignored by the patient until strangulation necessitated surgical intervention.

Associated hernias of any type were reported in nineteen cases and in eight instances the patient had had a previous hernia operation. Three of these were inguinal herniorrhaphies on the same side as the ultimately strangulated femoral hernia, and in two other cases a strangulated femoral hernia was reduced at operation without herniorrhaphy only to strangulate again.

TABLE 5. *Differential Clinical Findings When Omentum Is the Only Structure in the Sac*

Findings	Incidence (Per Cent)	
	Small Bowel Present	Omentum Only
Pain in hernia	73.7	100.0
Abdominal pain	92.7	25.0
Vomiting	93.3	33.3
Borborygmus	72.3	16.7
Obstipation	75.0	22.2
Acetonuria	27.0	0.0

Diagnosis

In computing the accuracy of the admission diagnosis, seven cases are included who were not operated upon as in four of these cases the strangulated hernia was not recognized, and a fifth case was diagnosed as a strangulated inguinal hernia. If one considers the diagnosis of strangulated inguinal hernia essentially correct inasmuch as the treatment is the same, one finds the overall percentage of correct diagnosis is 89.8 (table 6). The diagnosis of strangulated femoral hernia was made in 75.0 per cent of cases and with equal incidence in the two sexes. However, the diagnosis of strangulated hernia, inguinal or femoral, was made in all but one male, and the overall incidence of this diagnosis was about 10 per cent higher in the male. This suggests that strangulated hernia as a source of obstruction was more carefully looked for in the male, even though more often erroneously classified as an inguinal hernia. The average size of the herniated

mass in the male was actually somewhat less than that in the female.

The importance of an accurate diagnosis is reflected in the average delay before operation according to the diagnosis made. A surgical incision was made on an average of 7.1 hours after admission when the diagnosis was strangulated hernia. With a diagnosis of intestinal obstruction

TABLE 6. *Incidence of Correct and Incorrect Diagnoses at Admission and Average Time in Hospital Before Operation*

	Per Cent			
Diagnosis	All Cases 108	Males 34	Femls. 74	Time in Hospital Before Operation
Strangulated femoral hernia	75.0	73.5	75.7	7.1 Hrs.
Strangulated inguinal hernia	14.8	23.6	10.8	6.7 Hrs.
Strangulated hernia, inguinal or femoral	89.8	97.1	86.5	7.1 Hrs.
Intestinal Obstruction	6.5	2.9	8.1	78.4 Hrs.
Other	3.7	0.0	5.4	108.0 Hrs.

the delay amounted to 78.4 hours and in two cases with other diagnoses the average delay was 108.0 hours. Of three cases diagnosed as strangulated hernia and not operated upon, one died as the spinal anesthetic was administered, one was considered too critical for operation and died five hours after admission and one was transferred to another hospital. Of four cases not operated upon because the diagnosis was missed, all died. The interval from admission and time of death ranged from eighteen hours to five days.

When the patient was previously aware of a hernia, the correct diagnosis was made in 95.3 per cent of cases. Even here the diagnosis was missed in four cases, either because the information was ignored or overlooked or not thought to be the primary problem when considered as a possibility. When the patient came in with strangulation as the first recognized symptom of a hernia, the incidence of a correct diagnosis was 76.5 per cent.

Operation, Complications, Duration of Hospital Stay

An inguinal approach through an oblique incision above and parallel to the inguinal ligament exposing the inguinal canal offers certain advantages in the operation for strangulated femoral hernia, the most important being better exposure of the involved intestine and greater ease in the resection of a gangrenous bowel, should this be necessary. Entry into the peritoneal cavity may also be carried out readily when advisable through an inguinal approach. In many instances a combined inguino-femoral approach is actually used, usually by reflecting the lower flap of skin and superficial fascia downward exposing the femoral protrusion. It is not possible to discuss the incidence of recurrence from the information available in this series as the follow-up has been inadequate; but I would agree with the operative technic described by Dickson[19] and actually described earlier by Lotheissen[20] in which an approximation of the transversalis fascia to Cooper's ligament is made, and suture of the inguinal ligament to Cooper's ligament becomes of secondary importance and may be unnecessary. Some statistics appear to show that in the nonstrangulated femoral hernia the incidence of recurrence following a femoral repair is as low or lower than that after an inguinal repair,[2] although anatomically the inguinal operation certainly appears to be more correct. In cases operated upon during the first seven years this report covers, the femoral approach was used even slightly more often than the inguinal; but in the last seven years the inguinal approach has been used in the great majority of cases. In ten instances a laparotomy incision was done primarily because of uncertainty of the diagnosis.

Some variety of repair usually followed treatment of the hernial sac and its contents, but in thirteen instances in the entire series herniorrhaphy was not done either because the approach was through the abdomen or the patient's condition was judged to be too poor to allow any more than the minimum of surgery. The ultimate fatality in six of these thirteen cases attests to the poor condition in this group.

TABLE 7. *Incidence of Complications*

	Survivals with		
	No Complications	Major Complications	Wound Infections All Cases
All cases	66.7	33.3	20.8
Viable Contents	90.3	9.7	4.3
Gangrenous Contents	44.0	56.0	33.3

Major complications in the postoperative period involving all of the major systems of the body, as well as of the wound itself, were encountered. The presence or absence of gangrene of any of the sac contents determined the incidence of these complications to a great extent (table 7). The presence of any major complication prolonged the necessary hospital stay from an average of 13.2 days in the uncomplicated to an average of 38.0 days.

RESULTS AND FACTORS INFLUENCING MORTALITY IN STRANGULATED FEMORAL HERNIA

Overall Results

The hospital mortality rate in 107 cases of strangulated femoral hernia treated at this hospital was 28.0 per cent (table 8). Six of these patients did not receive definitive surgical treatment because of a missed diagnosis, critical condition or death from spinal anesthesia; the remaining 101 patients

will be considered further in an analysis of the results obtained.

Twenty-four patients were operative mortalities, an incidence of 23.8 per cent. This figure lies about midway among mortality statistics reported in the literature in various series, e.g., 12.9 per cent,[13] 14.0 per cent,[3] 14.6 per cent,[5] 17.7 per cent,[21] 20.0 per cent,[2] 23.1 per cent,[11] 25.9 per cent,[9] 32.0 per cent,[8] and 37.0 per cent.[22] Of seventy-three nonstrangulated femoral hernias operated upon at this hospital, there was one mortality, an incidence of 1.4 per cent. Others report a similar or lesser mortality.[8, 9, 14, 23]

TABLE 8. *The Overall Mortality Rate in Strangulated Femoral Hernia*

	Total Cases	Deaths	Per Cent Mortality
All Cases	107	30	28.0
Operated Cases	101	24	23.8

Within the surgically treated group of strangulated femoral hernias there are several factors which influence the mortality, some to a much greater degree than others, although none is totally independent of the others. As already mentioned, however, the mortality rate in six nonoperated cases was 100 per cent. Thus, the need for surgical intervention is clear, although occasionally the patient may be in such poor condition that operation is impossible.

Influence of Sac Contents on Mortality

When the hernial sac contains structures other than small bowel, the prognosis has proved to be much better than when small bowel is present (table 9). Profound disturbances of fluid and electrolyte balance take place in the presence of intestinal obstruction incident to the incarcerated small bowel which are found only to a much lesser degree when small bowel is not incarcerated. The only death in this latter group occurred in a 68 year old female who had symptoms for twelve days, vomiting for ten days and a delay in treatment after admission for two days due to an incorrect diagnosis. The patient had a Richter's type of herniation of the sigmoid which was reduced through a suprapubic laparotomy, and at the same time a small ovarian cyst was excised. This additional procedure was no doubt poor judgment. At postmortem examination thirteen days after operation an acute peritonitis was found.

Table 9. *The Influence of the Contents of the Hernial Sac and the State of Viability on the Mortality Rate*

	Total Cases	Deaths	Per Cent Mortality
Small Bowel in Sac	89	23	25.8
No Small Bowel in Sac	12	1	8.3
Viable Contents	59	7	11.9
Gangrenous Contents	42	17	40.5

Viability of Sac Contents and Mortality

Just as important in determining the prognosis is the presence or absence of gangrene within the hernial sac. The incidence of gangrene in this series was rather high, and with gangrenous sac contents the mortality rate was 40.5 per cent as contrasted to a mortality of 11.9 per cent when gangrene had not occurred. However, the combination of these two factors, gangrene of a loop of small bowel, furnishes the one most lethal constituent of a femoral hernia, for the mortality rate then reaches 45.7 per cent. Becker[24] reported a mortality rate with gangrenous small bowel of 26.5 per cent in thirty-four surgical cases and other figures are 50.0 per cent,[3, 25] 60.6 per cent,[12] 73.1 per cent[11] and 83.0 per cent.[8]

Influence of Method of Treatment on Mortality

The method of handling of the nongangrenous cases is straight forward, and it is usually not difficult to decide whether or not gangrene is present. There is no evidence in this series that truly gangrenous bowel was ever inspected and through a misinterpretation returned to the peritoneal cavity.

When gangrene of the small bowel is present, the method of choice according to all authors is resection and primary anastomosis. This was found to be the case in the present series, and the mortality rate was 30.4 per cent in twenty-three cases with gangrenous small bowel treated by resection and primary anastomosis (table 10). Becker[24] reported a mortality of 28.6 per cent in twenty-one resected cases with primary anastomosis, and other figures are 37.3 per cent,[13] 50.0 per cent,[12] 50.4 per cent,[26] 62.5 per cent[11] and 66.7 per cent.[3, 7] In five resected cases an enterostomy was made proximal to the anastomosis with two deaths; this procedure is usually considered dangerous and not to be recommended.[11, 27, 28] It appears to increase the operative risk rather than offer protection, presumably against an insecure anastomosis.

Table 10. *Influence of the Method of Handling of Gangrenous Small Bowel on the Mortality Rate*

	Total Cases	Deaths	Per Cent Mortality
Resection and primary anastomosis	23	7	30.4
With proximal enterostomy	5	2	40.0
Without enterostomy	18	5	27.8
Gangrenous loop not resected	1	1	100.0
Exteriorization	7	7	100.0
Inversion area of gangrene	2	1	50.0
Excision area of gangrene and closure	2	0	0.0

The type of anastomosis did not appear to affect the mortality rate in this series (table 11), which

is in accord with the findings of Frankau.[13] However, the two deaths following side-to-side anastomosis were cases in which a proximal enterostomy was also done. McNealy et al,[12] Jarboe and Pratt[11] and Beller and Colp[5] all found some preference for a side-to-side anastomosis.

In four cases gangrene involved only a portion

Table 11. *Influence of the Type of Anastomosis on the Mortality Rate*

Type of Anastomosis	Total Cases	Deaths	Per Cent Mortality
End-to-end anastomosis ..	16	5	31.3
Side-to-side anastomosis ..	7	2	28.6

of the circumference of the wall of the bowel, and in two instances this area was merely invaginated while in two others the gangrenous area was excised and the defect in the bowel closed. There was one death in these four cases, a mortality rate similar to the eight cases in which Jens[3] did a minor procedure. A favorable response is no doubt to be expected when the area of gangrene is quite limited. However, Becker[24] noted a mortality of 40.0 per cent in such cases and Jarboe and Pratt[11] consider invagination dangerous. Perhaps the safest procedure in such cases is an excision of the gangrenous area when it is small with closure of the defect in the bowel wall. If the area of gangrene is extensive, excision of the entire segment of bowel with primary anastomosis may be done with the expectation of a relatively good result.

In seven cases an exteriorization procedure with a double barreled enterostomy was done, apparently because the patient was in poor condition in some cases but in other cases as an elective procedure, and in every case a fatality resulted. In five cases death occurred after the primary operation, while in two others death followed a secondary operation at a later date when closure of the enterostomy by anastomosis was attempted. McNealy et al,[12] reported eleven exteriorization procedures with nine deaths, a mortality rate of 81.8 per cent. Jarboe and Pratt[11] comment that exteriorization may be done if necessary. Perhaps in an occasional case this procedure may appear to be necessary but, if at all possible, one should proceed with a primary anastomosis, for certainly the results could be no worse. In the last seven years an exteriorization procedure has been done in only two instances in twenty-three cases of gangrene of the small bowel.

In one case a gangrenous loop within the peritoneal cavity in addition to a second viable loop found in the hernial sac was not recognized and no resection was done.

Division of the inguinal ligament is thought to be permissible in those cases in which this seems necessary[12, 23, 29] although it is felt by some that the recurrence rate will be increased and there may be some permanent weakness of the abdominal wall.[27] With the thought that this step might simplify the operative procedure and thereby result in a decreased mortality, the results were investigated in the cases in which this was done in this series. In thirty-two cases the inguinal ligament was divided, and most frequently this procedure was found necessary when gangrene of the small bowel was present. However, the mortality rate in these cases was higher than that in the group as a whole, and this was found to be true when the group was broken down into those with and without gangrene of the small bowel. This result may be related to a more severe and longer period of incarceration in these cases which makes reduction without division of this ligament difficult and adds to the poor condition of these patients. In any case it would seem wise to defer release of the constriction until the blood supply to a gangrenous loop has been divided as recommended by Dennis and Varco.[29] Knight[30] in experimental work with cats has shown a depressor effect from injection of human peritoneal exudate and venous blood from strangulated loops, and the same effect was produced when viable strangulations of intestine in the animals were released. The latter result depended to some extent on a relatively poor condition of the animal. Knight suggested that in long standing strangulations without gangrene in patients in poor condition, resection might be advisable rather than simple release of the strangulation. He also recommended thorough aspiration of the peritoneal exudate in all cases.

Influence of Age and Sex on the Mortality

The age of the patient was found to influence the mortality rate quite strikingly in this series. In patients less than 40 years of age there were no fatalities; under 50 years the operative mortality in all cases was 5.5 per cent, and in those more than 50 years the rate was five times this figure. A consistently higher mortality rate was found in the older groups whether gangrene is present or not.

The mortality rate was 26.1 per cent in females and 18.7 per cent in males, this difference in mortality being partly due to a few more errors in diagnosis in females and partly due to a selection of a less favorable method of treatment of gangrene of the bowel in several female patients with an extremely high mortality in these cases.

Influence of Anesthesia on the Mortality

The most favorable anesthesia in this series was spinal, and this was true whether gangrene of the small bowel was present or not (table 12). The mortality rates with local anesthesia were considerably higher, and apparently higher than could be accounted for by the fact that local anesthesia is frequently employed when the condition of the patient is particularly bad. If only the cases of

gangrene of the small bowel treated by resection are considered, spinal anesthesia still proved to be the safest anesthetic. General anesthesia was used the least often, and the results were not so good as with spinal but were apparently better than when local was used. However, in resection of the small bowel, although general anesthesia was used five times, four of the times it was used only to supplement either spinal or local; in the one case it was used alone a fatality resulted.

Most authors have been emphatic in their preference for local anesthesia[3, 5, 14, 23, 29] while others[11, 13] would select either spinal or local. Although Jens[3] had no mortality in eighteen cases in which spinal anesthesia was used when viable contents were present, he did not use spinal when gangrene was present and selected local as the preferred anesthetic. His mortality rate in sixteen cases with gangrene of the small bowel was 50.0 per cent using local anesthesia.

Table 12. *Mortality Rates with the Various Anesthetics*

Category	Spinal	General	Local
All Cases	50	23	33
Deaths	10	6	10
Per Cent Mortality	20	26.1	30.3
Exclusive of Gangrene of small bowel	31	12	23
Deaths	3	2	3
Per Cent Mortality	9.7	16.7	13.0
Gangrene of small bowel	19	11	10
Deaths	7	4	7
Per Cent Mortality	36.8	36.4	70.0
Gangrene of small bowel treated by resection	16	5	6
Deaths	4	1	2
Per Cent Mortality	25.0	20.0	33.3

Influence of the Duration of Symptoms on Mortality

The duration of symptoms affects the mortality rate quite consistently, and this is due in part to the poor condition of the patient as the time of strangulation increases as well as the increased incidence of gangrene. The average duration of symptoms in cases of strangulation of the small bowel without gangrene was 2.2 days, and with gangrene 4.0 days. Of the latter, in those who lived the average duration of symptoms was 3.1 days, and in those who succumbed 5.2 days. Gangrene of the small bowel occurred only two times when the symptoms were of less than twenty-four hours duration. With gangrene of the small bowel the mortality rate increases as the duration of symptoms is prolonged.

Fecal Vomiting and Mortality

It has been shown that fecal vomiting is an ominous sign suggesting gangrene of the small intestine. In the entire series fecal vomiting occurred twenty-six times with an overall mortality of 50.0 per cent. The appearance of fecal vomiting, whether gangrene of the small bowel is present or not, is associated with an increased mortality.

Influence of a Correct Diagnosis on Mortality

In estimating the influence of a correct diagnosis on the mortality it is found that the mortality rate is almost three times as great when the diagnosis was incorrect as when the diagnosis of strangulated hernia, inguinal or femoral, was made (table 13). When the six nonoperated cases are included, the discrepancy is even greater. In those cases admitted with strangulation as their first symptom of a hernia, the diagnosis was more often incorrect, the duration of symptoms longer and the mortality rate higher than when the patient had previously been aware of a hernia. In addition, in all cases the delay in operation was increased markedly when the diagnosis was missed, and it was found that the average time in the hospital before operation was about four times longer in all patients who died than in those who survived.

Table 13. *Influence of Diagnosis on Mortality Rate*

Diagnosis	Operated Cases Only			All Cases		
	Total	Deaths	Per Cent Mortality	Total	Deaths	Per Cent Mortality
Correct diagnosis*	94	20	21.3	96	22	22 9
Incorrect diagnosis	7	4	57.2	11	8	72.7

* Refers to diagnosis of strangulated hernia, whether inguinal or femoral.

Preparation of the Patient

Proper preparation of the patient for surgery has long been recognized as a prerequisite for successful treatment. The preoperative preparation of the patient in this series has been fairly uniform with emphasis on fluid and electrolyte replacement, continuous gastric suction and supplementary parenteral vitamins, particularly vitamin C and vitamin K, when this seems indicated. In more recent years the more liberal use of blood has been practiced, and chemotherapy and antibiotics have been added to the preoperative and postoperative care.

Table 14. *Comparison of Results in First Seven Years and Last Seven Years*

Category	First 7 Years			Last 7 Years		
	Total Cases	Deaths	Per Cent Mortality	Total Cases	Deaths	Per Cent Mortality
All Cases	44	13	30.8	57	11	19.3
Viable Small bowel	26	4	15.4	28	3	10.7
Gangrene Small bowel	12	8	66.7	23	8	34.8
Resection Gangrene of small bowel and anastomosis	6	3	50.0	17	4	23.5
Above without proximal enterostomy	3	1	33.3	15	4	26.7
Exteriorization	5	5	100.0	2	2	100 0

There is a definite improvement in the mortality statistics in the last seven years (table 14), no doubt due in some measure to better preparation of the patient for surgery, as well as improved after care. However, it should be emphasized that proper surgical management is still of prime importance

and resection and primary anastomosis of gangrenous bowel continues to give the best results. In two exteriorization procedures done in the last seven years, the mortality rate was 100.0 per cent.

Causes of Death

When the twenty-four operative deaths were carefully reviewed, it was found that in twenty instances there had been either an error in diagnosis or some deviation from what is considered to be the best surgical treatment, or both. Thus, there was a missed diagnosis and a consequent delay in treatment in six cases. Although there was no case in which gangrenous bowel within the sac was not recognized and thereby returned to the abdominal cavity, in one case an intra-abdominal gangrenous loop was not visualized, and the patient succumbed. There were seven exteriorization procedures, with a fatality in each instance, and in two of the cases in which an enterostomy was made proximal to an anastomosis, fatalities ensued. In every instance in which gross spillage of intestinal contents occurred, of which there were five, the patient died.

The main cause of death as determined at postmortem examination in twelve cases included a variety of findings with peritonitis the outstanding pathologic condition in six. This was not shown to be due to a leaking anastomosis in any case.

Previous Admissions

Twenty-five of these patients had had a previous admission to the St. Louis City Hospital, usually for some other disease. In sixteen instances this admission was within the known duration of the hernia, but in six cases the physical examination was not revealing and a diagnosis of femoral hernia was not made. Of the remaining ten cases, three were offered surgery and refused. In seven cases surgery was not recommended, usually because the femoral hernia apparently was not thought to be important, and in these seven cases two ultimately died with a strangulated hernia. This is not a large number, perhaps, but with the low mortality in uncomplicated femoral hernia repair, they may be considered as preventable deaths. It is felt that the mortality after femoral herniorrhaphy is so low and the incidence of strangulation so high that all femoral hernias should be repaired, regardless of age, unless there are serious contraindications. The incidence of femoral hernias admitted with strangulation is high in nearly all series, and Berger[1] has estimated the chance of accident in all femoral hernias to be around 9.0 per cent. Thus, if operation is recommended in all uncomplicated femoral hernias seen, and particularly in the type of patient seen among the medically indigent who are often neglectful of requesting early medical aid in serious illness, it should be possible to show a distinct salvage over and above that which follows a policy of nonsurgical management.

SUMMARY

1. One hundred and eight cases of strangulated femoral hernia seen in a fourteen-year period are reviewed. The incidence of strangulation of all femoral hernias at admission to the hospital was 53.2 per cent.

2. Gangrene of the sac contents was found in 41.6 per cent of operated cases.

3. Factors contributing to the development of gangrene of the hernial sac contents are:

(a) long duration of symptoms;

(b) errors in diagnosis with consequent delay in treatment;

(c) the presence of small bowel within the sac which becomes gangrenous more often than omentum, large bowel or appendix;

(d) the male sex who had gangrenous contents more often than females;

(e) right sided hernias which develop gangrene twice as often as left sided hernias;

(f) age of the patient; patients more than 50 years have gangrene in a much greater proportion of cases than those under 50 years.

4. Clinical findings which suggest gangrene of the small bowel if present within the hernial sac are:

(a) fecal vomiting;

(b) discoloration of the hernia;

(c) temperature of 100.0 F. or over.

Acetonuria, tenderness of the hernia, the pulse and the white blood cell count are of less or no differential value in estimating viability in strangulated femoral hernias.

5. The recommended surgical treatment includes an inguinal approach in all cases and resection and primary anatomosis when gangrene of the small bowel is found. Complimentary enterostomy should not be necessary and is not recommended. Exteriorization procedures should be avoided if at all possible. A Cooper's ligament herniorrhaphy appears desirable on anatomic grounds.

6. Spinal anesthesia has given the best results; local anesthesia may be used if spinal is contraindicated.

7. Major complications including wound infection occurred in 24.7 per cent of those who survived. Wound infection developed in 20.8 per cent of all cases, but was eight times as common when gangrene was present.

8. The overall mortality rate in all cases was 28.0 per cent; in operated cases the mortality was 23.8 per cent.

9. Factors influencing the mortality rate are:

(a) hernial sac contents; the mortality rate is highest when small bowel is present;

(b) viability of hernial sac contents; gangrene markedly increases the mortality rate;

(c) method of treatment of gangrenous small bowel; the mortality rate with exteriorization procedures was 100.0 per cent, with resection and primary anastomosis, 30.4 per cent;

(d) the age of the patient;

(e) the duration of symptoms;

(f) fecal vomiting;

(g) the accuracy of the admission diagnosis and the consequent time interval before operating;

(h) preparation and after-care of the patient.

10. It is recommended that repair of all non-strangulated femoral hernias should be done unless strongly contraindicated because of the high incidence of strangulation with a greatly increased mortality rate.

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A STUDY OF SYMPATHETIC BLOCKS

CONSIDERATION OF THE FACTORS AFFECTING THE CLINICAL RESULTS

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The sympathetic nervous system has assumed new importance in clinical medicine since a more comprehensive understanding of its anatomy and physiology has been acquired.[2, 18] This has been made possible through clinical observations following sympathetic nerve blocks and surgical removal of sympathetic ganglia, and the results of experimental work observed on animals.

Diagnostic and therapeutic sympathetic nerve blocks are accepted procedures for certain peripheral circulatory disturbances. However, variable and uncertain clinical results are due largely to (1) the selection of cases, (2) the interpretation of the response and (3) the success in producing a block. Absence of normal circulatory response or of clinical improvement is due either to organic peripheral vascular disease or to an unsuccessful nerve block; the differentiation may be difficult and uncertain. Now, by means of electro-resistance skin studies, the effectiveness of the nerve block can be demonstrated. This investigation was undertaken to study the effect of proven sympathetic blocks, as determined by electro-skin resistance, oscillometric and peripheral skin temperature readings, color changes and clinical results on patients with various peripheral circulatory symptoms.

MATERIAL STUDIED

Patients were selected for study whose symptoms might be benefited by temporary sympathetic nerve block or those who were considered for sympathetic neurectomy.[8] Systemic infection, dicumarol hypoprothrombinemia and severe general debility or systemic disease were considered contraindications (see table 1).

METHOD OF STUDY[1, 2]

All patients were stabilized on a cart in the anesthesiology room for at least one hour to obtain standard conditions.[29] Oscillometric readings were taken at constant sites on the ankle, leg and thigh; peripheral skin temperature[32] readings were taken at selected sites on the foot, toes and leg; and skin resistance determinations at comparative sites were repeated three times before the nerve block to assure stabilization of these determinations. After the sympathetic nerve block the oscillometry[9] and skin temperature readings were

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repeated. Then, the patient was warmed[30] by covering with blankets and an electric pad on medium heat (45 C.) was placed on the abdomen for at least one half hour and the skin resistance studies repeated. The resistance studies were done using the neurodermometer described by Richter,[30, 31] with a minor variation in the electrode. This determines the degree of sweat gland activity as an evidence of sympathetic activity. The Tycos Dermatherm was used to measure skin temperatures.

Table 1. *A Study of 31 Patients Referred for Sympathetic Block*

Patient	Sex	Age	DIAGNOSIS	Block Done	No.	SUBJECTIVE RESULT	FOLLOW UP
EB	M	55	Intermittent Claudication	Lumbar	3	Little improvement	Sympathectomy with fair result
AB	M	49	Cerebral Hemorrhage	Stellate	1	Minimal immediate response	Gradual recovery—probably not helped by block
WC	M	59	Intermittent Claudication	Lumbar	3	Good subjective relief	Progressive arterial insufficiency—with amputation
MF	F	20	Thrombophlebitis	Lumbar	2	Marked response with pain relief	Edema lessened—patient cured
RG	F	66	Arteriosclerotic Gangrene	Lumbar	3	Excellent subjective response!	Sympathectomy with good results
LG	F	63	Postmastectomy Edema	Stellate	1	Moderate improvement	Did not return for study
SG	F	32	Rheum. Heart Dis., Hemiplegia	Stellate	3	No immediate effect	Patient obtained a very good delayed response
LG	M	54	Intermittent Claudication	Lumbar	1	No change whatever	
JH	M	42	Cellulitis of arm	Stellate	1	Fair relief of pain	Rapid disappearance of edema
JH	M	62	Arteriosclerotic Gangrene	Lumbar	3	Marked response immediate	Sympathectomy with very fine result—foot healed well
AJ	M	60	Diabetic with leg ulcer	Lumbar	2	Marked response immediate	Sympathectomy with good response
PL	F	58	Postmastectomy Edema	Stellate	3	Marked response immediate	Edema lessened
CL	M	79	Arteriosclerosis, far adv.	Lumbar	2	No change whatever	Patient expired, bronchopneumonia
WC	M	55	Varicose Ulcers	Lumbar	3	Marked immediate response	Sympathectomy with marvelous response
OM	F	29	Fracture with stiffness, old	Stellate	1	Excellent response	Stiffness disappeared—cured
MM	M	75	Leg Ulcer	Lumbar	1	Moderate relief	Ultimate result poor
NS	F	62	Diabetic with impending Gangrene	Lumbar	2	Relief of pain only	Amputation necessary
JN	M	50	Skin graft to leg	Lumbar	2	Warmth in leg	Graft took well; patient had had sympathectomy in 1945!
CO	F	67	Arteriosclerotic Gangrene	Lumbar	1	Marked relief of pain and edema	Edema decreased
HO	F	32	Pain under cast	Lumbar	1	Marked relief	Complete relief; large psychic element
AP	M	64	Diabetic Gangrene	Lumbar	3	Marked relief from pain only	Amputation necessary
CR	M	68	Intermittent Claudication	Lumbar	6	Moderate relief of pain	Very little objective response
WS	M	60	Postinfectious edema	Lumbar	2	Excellent relief of pain, edema	Motion much improved, good result
VS	F	54	Diabetic Gangrene	Lumbar	1	Marked lessening of pain	Amputation necessary
WS	M	56	Diabetic Impending Gangrene	Lumbar	1	Patient expired postoperatively from retroperitoneal hemorr.	
JW	M	65	Ulcer of arm with edema	Stellate	1	Excellent with complete healing	
KW	F	65	Thrombophlebitis	Lumbar	2	Excellent response	Pain, motion, edema all lessened immediately
LW	F	70	Potts Fracture, Diabetic	Lumbar	2	Fair response, pain lessened	Edema lessened appreciably
AW	M	57	Peripheral Vascular Shut Down	Lumbar	1	No change whatever	This condition followed 14 weeks in Buck's traction
CZ	M	74	Postinfectious stiffness Hand	Stellate	1	No change whatever	Patient put on physiotherapy—poor response
CP	F	62	Art. Embolus to Right Leg	Lumbar	1	Patient was turned prone in spite of acute cardiac decompensation; plus previous etamon and heparin therapy; and was given the block.	
					—		
				Total	59	Patient expired a few hours later. A case of poor judgment. (This case was not a part of this study and is included for teaching purposes.)	

TECHNIC OF BLOCKS

Lumbar Blocks:[8, 4] After superficial infiltration to minimize pain, a five inch needle is made to contact the transverse process of the vertebrae, the point shifted to pass above or below the process and advanced to contact the vertebral body, then advanced from 1 to 2 cm. deeper. Aspiration is made in four places before injection of 10 cc. of 1 per cent procaine solution without adrenalin in each area. Care is taken to avoid intraspinal injection.[34] There have been no untoward effects with this method.

Cervical Blocks:[35] Penetration of the apical pleura or injury of large vessels may occur in this area. However, the method described by Francis Grem, M.D., has resulted in no untoward effects and 95 per cent effectiveness. A two inch needle is made to contact the seventh cervical transverse process. The needle point is then kept on bony surface and advanced to contact the vertebral body at which point the needle will lie almost horizontally. Injection is made after attempting aspiration. The seventh process is identified easily by inserting the needle one finger breadth below the prominent tubercle of the sixth transverse process which is readily palpable. Thus at no time is contact lost with bony landmarks and no dangerous explorations are made with the point of the needle.

Alcohol injections were not done, the concensus of opinion in the literature being against their use.[7, 8, 11] Neither was any effort made to prolong the action of the procaine,[33, 37] although hyularonidase may prove effective for this purpose.

All the blocks and determinations in this study were done by one of us (B.H.) since uniform experience with procaine blocks and the instruments used was desirable. This minimized error in readings.

RESULTS

Best results were obtained in conditions involving vascular spasm.[7] The response of diabetic arteriosclerotic peripheral vascular disease was varied, but in general was only fair and was exceedingly poor in advanced cases. Four cases of intermittent claudication were studied and none responded satisfactorily. Two cases were cerebral vascular accidents responded slowly and three obtained marked improvement. Three cases of postmastectomy edema of the arm, six to eight months postoperatively, responded favorably; two of long standing edema experienced some reduction in the edema and pain. Three fracture cases with peripheral circulatory symptoms responded satisfactorily with relief from pain and edema. One man with old varicose ulcers responded favorably to blocks, and sympathectomy was done with definite improvement. Sympathectomy was being contemplated on the contralateral side in view of the excellent result.

One case was of peripheral vascular occlusion following fourteen weeks in Buck's extension. Both legs were blue, cold and painful. Beneficial results were anticipated in this patient but the response was poor.

One case had an elevation in skin temperature in the opposite leg following the sympathetic block but not on the injected side. Dr. F. Grem had a similar experience and one of us (F.T.) had two cases with similar responses. Repeating the injections on the same or opposite side gave the same results of crossed action. The explanation for this phenomenon is obscure.

DISCUSSION

Changes in the caliber of arteries and veins are brought about primarily through changes in the state of contraction of the musculature of these vessels. Increase in the caliber of these vessels may be brought about by inhibition of the circular muscles, increased blood pressure sufficient to counteract the natural elasticity of the vessel walls or active vasodilation. To what extent caliber changes are dependent on nervous influences and to what extent on the direct effect of the metabolic products is not known with certainty. The results of investigations have led to widely divergent conclusions.[3]

Kuntz[3] points out that "when the vasoconstrictor fibers supplying a given area are severed the blood vessels in this area immediately dilate due to removal of tonic impulses. Not infrequently, however, vessels deprived of their vasoconstrictor innervation in this manner will later become actually smaller in caliber than the normally innervated vessels of the opposite side, even before the possibility of regeneration. This is thought to be due to reaction of the musculature of the vessels to vasoconstrictor substances in the blood."

Herrick, Essen and Baldes in 1932 found the minute volume in the femoral artery on the side of denervation approximately double that on the opposite side following unilateral lumbar sympathectomy. The circulation then gradually regained a degree of independent tonus and, as a rule, returned to normal levels within several months.[3] One of us (F.T.)[39] demonstrated on experimental animals that the beneficial effects of sympathectomy on the collateral arteriolar circulation was present for only three weeks.

Our cases of intermittent claudication sustained Friedlander's observations that sympathectomy does not increase the blood flow to the muscle. Freeman and Grodins in 1941[10, 11] pointed out that the circulation to the skin and muscle may be independently regulated. Friedlander et al, in 1940 reported that the vasodilation produced by paravertebral block, spinal anesthesia and reflex heat failed to increase the muscle circulation, although there was an increase in the skin circulation in each case.[11] Grant,[38] Silbert and Bierman share this view. Grimson[36] and Shen and deTakats[25, 27] share an opposite view, namely, that the blood vessels of skeletal muscles react to sympathetic vasomotor impulses and increase the blood supply to these muscles. Accordingly, Friedlander contends that blocks for wounded limbs with endangered blood supplies are contraindicated.[22] Muscle ischemia is the most important factor and blocks only serve to shunt blood into the skin where it is needed least. This may be one of the reasons why Volkman's contracture is more common in injuries involving nerves.[23] It is an accepted fact that the sympathetic supply to the blood vessels of the skin is much greater than that to the deeper vessels and that there are no parasympathetic fibers to the peripheral blood vessels.[3] However, the actual anatomic organization of these autonomic pathways is still obscure.[2, 3, 4, 8]

We definitely feel that cerebral vascular accidents should be given the benefit of blocks, especially in the early stages.[15] Volpitto and Risteen[26] report seven cases of cerebral vascular accidents with marked immediate or delayed response to sympathetic block. These investigators had the unusual opportunity of watching the pial vessels through trephine holes as the block was being done.

Two cases of thrombophlebitis obtained definite improvement in accord with the work done by Oschner[21] and Nicholson.[17] "Irritation of the vein sets up reflexes which result in spasm of arterioles"[19] and explains the vasospastic phenomenon that is relieved by blocks. Thrombophlebitis must be distinguished from phlebothrombosis since blocks are not indicated in the latter.

Postmastectomy edema of the upper extremity will show considerable improvement if the blocks are done early. Once the edema has had a chance to organize, there is little hope of reducing it materially. Hanalin, Williams and Wernick[20] reported

a series of twenty-five cases in which 95 per cent obtained immediate relief; 80 per cent obtained persistent relief. This type of edema is thought to be due to a mixture of venous obstruction, secondary lymph stasis and a neurovascular element with irritation of peripheral nerves and organs of the sympathetic nervous system as pointed out by Leriche.[12]

The rationale for sympathectomy in obliterative vascular disease is given by deTakats[12, 25] who says that "the normal vasomotor tonus insures an even blood flow uninfluenced by anything but the metabolic needs of the tissues." In other words, after sympathectomy, the limb was free from the influences of cold, emotion and the upright position. This is a most important concept. The good results reported are evidence for doing the sympathectomy. While a decided increase in basal blood flow may not be expected after sympathectomy, fluctuations in blood flow due to external influence do occur even in limbs with marked obliterative sclerosis; these fluctuations are eliminated.

Skin temperature readings are valuable in this type of study. A rise of surface temperature to the normal level and increased redness of the skin may follow sympathetic ganglionectomy. The important observation in skin temperature readings is the maximum temperature obtained, or the "maximum vasodilatation level,"[5] normally above 31.5 C. should be reached in the feet and legs; and if vasodilatation by means of blocks does not produce temperature rise to this figure, organic disease is presumed to be present (or the block was not done properly). Morton, Scott and White[5] have devised an "Occlusion Index" based on this principle and state that the total rise is not so important but only how near the normal value the temperature comes. This we found to be true in our study. Blocks rarely benefitted patients with warm extremities other than to relieve pain.

Since the sympathetic system innervates both the capillaries and the sweat glands, the value of electro-resistance skin studies depends upon the following facts:[30]

1. The electro-resistance to the passage of a minute current is localized in the skin.

2. Skin resistance is controlled largely through the nervous system, mostly through sympathetic channels. 3. Skin electro-resistance varies directly with sweat gland activity.

4. Normally innervated skin shows regions of low and high electro-resistance. Heating the patient in a heat cabinet will abolish these different areas and sharpen areas of denervation.

5. Local factors such as irritation or abrasions will influence (decrease) the resistance to the passage of the electric current.

Table 2. *Comparison of Changes in the Electro-Skin Resistance, Skin Temperature and Oscillometric Studies in Determining the Efficacy of the Sympathetic Block*

	SKIN RESISTANCE Average Change After Block	SKIN TEMPERATURE Average Change After Block and Number	OSCILLOMETRY Average Change After Block
1. Intermittant Claudication	No Change	1. No Change	No Change
2. Intermittant Claudication	5 Units	2. No Change	No Change
3. Intermittant Claudication	No Change	3. No Change	No Change
4. Intermittant Claudication	.....	No Change	No Change
5. Intermittant Claudication	40 Units	2.6 Degrees Increase	1 Unit Increase
6. Intermittant Claudication	.....	No Change	No Change
7. Arteriosclerotic Gangrene	5 Units	1. No Change	No Change
8. Arteriosclerotic Gangrene	40 Units	2. No Change	0.1 Unit Increase
9. Arteriosclerotic Gangrene	40 Units	4.5 Degrees Increase	0.3 Unit Increase
10. Arteriosclerotic Gangrene	.....	0.7 Degrees Increase	No Change
11. Arteriosclerotic Gangrene	90 Units	1.8 Degrees Increase	No Change
12. Diabetic Gangrene	60 Units	0.8 Degrees Increase	0.7 Unit Increase
13. Diabetic Leg Ulcear	80 Units	No Change	No Change
14. Varicose Leg Ulcer	5 Units	No Change	No Change
15. Skin Graft to Leg	50 Units	1. 2.0 Degrees Increase	No Change
16. Skin Graft to Leg	90 Units	2. 0.6 Degrees Increase	No Change
17. Thrombophlebitis	30 Units	1. 4.0 Degrees Increase	No Change
18. Thrombophlebitis	75 Units	2. 3.0 Degrees Increase	No Change

Accordingly, the resistance to the passage of the electric current is high in areas of sympathetic denervation due to the absence of moisture (sweating) and low in normal areas.[28, 29] Thus one has a simple and reliable method of checking whether or not the sympathetic nerve has actually been blocked.[29] At Cook County Hospital where hundreds of blocks are done by a large group of men under instruction on almost every type of case, it is important to know if the nerve has actually been blocked. In our study, ten cases obtained a good result according to resistance studies; but four of these cases of proven sympathetic paralysis showed no temperature or oscillometric response. This information demonstrates a successful sympathetic block although there was no other objective sign of vasodilation. This suggests a vascular system that will not be benefitted by sympathectomy. The Horner's syndrome obviates the necessity for this type of study in the upper extremity. Although not included in this study, work was being done on cases of trauma and local shock. We feel that cases of recent fractures with considerable swelling and pain and crushing injuries should be given the benefit of these blocks in accord with the work done by Shumacker[14] and Thompson.[24] Certainly, blocks should be used as a therapeutic test before sympathectomy.[16]

SUMMARY

The interpretation of the results of sympathetic

blocks has long been uncertain since it is not possible to differentiate organic occlusion of the vessels and failure of the block. A solution to this problem is to be found in the neurodermometer. This is a specially constructed ohmmeter, which gives a simple and reliable means for demonstrating the success of sympathetic blocks without relying on the skin temperature changes. The elimination of sweat gland activity resulting from the block greatly increases the skin resistance to the passage of minute electric current as compared to the normally innervated areas.

A survey of the material studied, the technic used, results and discussion are presented. A brief résumé of the pertinent physiology of the autonomic nervous system is presented with emphasis on the usefulness of the neurodermometer in sympathetic blocks.

CONCLUSIONS

1. The neurodermometer is a simple and reliable means of demonstrating the success of sympathetic blocks.

2. Clinical results following sympathetic blocks are best in relieving pain and vascular spasm of recent origin; but blocks should be tried on even seemingly "hopeless" obliterative vascular diseases.

3. Skin temperatures when accurately done are valuable in studies of this type; however, the temperature of initially warm extremities cannot be further elevated by blocks, although the accompanying pain may be relieved.

4. Oscillometric readings are rarely changed materially by sympathetic blocks. This is due to the fact that the sympathetic activity is mainly to small arterioles and capillaries; oscillometric readings determine the tonicity of the larger arterioles and arteries.

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SUGGEST STANDARDIZED NATIONAL INDIVIDUAL RADIATION RECORD

The adoption of a nationally standardized personal radiation-diary system to reduce to a readied exactness the composite previous radiation record of any individual was suggested in an article in the October 13 *Journal of the American Medical Association.*

The principal value of such a record would be to inform technicians and physicians of the cumulative biological effect of previous radiation, according to the authors, Drs. Maxwell H. Poppel, New York, and Joseph Sorrentino and Harold G. Jacobson, of the radiological service of the Veterans Administration Hospital, Bronx, N. Y.

An Advertisement of G. D. Searle & Co.

(The Council on Pharmacy and Chemistry of the American Medical Association has adopted the following statement of Actions and Uses and of Dosage for publication in connection with a description of Banthine Bromide for inclusion in New and Nonofficial Remedies)

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Actions and Uses.—Methantheline bromide, a parasympatholytic agent, produces both the peripheral action of anticholinergic drugs such as atropine and the ganglionic blocking action of drugs such as tetraethylammonium chloride. Tolerated amounts of methantheline bromide exert side effects typical of atropine-like drugs, but cause less tachycardia, and also less postural hypotension than does tetraethylammonium chloride. Toxic doses produce a curare-like action at the somatic neuromuscular junction.

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Dosage.—Methantheline bromide is administered orally or parenterally by either the intramuscular or intravenous route. Parenteral administration is not advised for patients able to take the drug orally. The average initial adult dose, oral or parenteral, is 50 mg. For patients with considerable intolerance, 25 mg. may be employed. In the management of peptic ulcer, a beginning schedule of 50 mg. three times daily before meals and 100 to 150 mg. on retiring is suggested. However, the usual effective dose is 100 mg. four times daily, although some patients may require more or less than this amount. The dosage may be increased to tolerance, using dryness of the mouth as a guide, and adjusted to meet the individual response of patients. Maintenance dosage in peptic ulcer is usually considered to be about one-half the therapeutic level. In the management of other hypermotile or hypersecretory states, the dosage should be adjusted to the smallest amount which will relieve the symptoms. When spastic conditions are secondary to inflammatory or other organic lesions, therapy directed toward the cause should be employed whenever possible.

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Hamblen, E. C.: North Carolina M. J. 7:533 (Oct.) 1946.

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*Perloff, W. H.: Am. J. Obst. & Gynec. 58:684 (Oct.) 1949.

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Postgraduate Review

INTESTINAL OBSTRUCTION, PARALYTIC ILEUS, MESENTERIC THROMBOSIS AND KINDRED LESIONS

L. R. SANTE, M.D.
ST. LOUIS

I feel honored, indeed, to inaugurate the Zimmermann Lecture in honor of Dr. Carl August Zimmermann, Cape Girardeau. Dr. Zimmermann was born in Quincy, Illinois, in 1872 and obtained his early education at St. Francis College (later Quincy College) from which he was graduated in 1894. The same year he entered St. Louis Medical College (later Washington University) where he received his medical education, graduating in 1897. He interned at the St. Louis City Hospital and at the Female Hospital in St. Louis under Dr. Harry Crossen. In 1899 he entered the private practice of medicine in East St. Louis.

In 1902 he became quizmaster at Washington University School of Medicine and it was while engaged in this work that he met Dr. R. Walter Mills and observed his work in the field of roentgenology. Stimulated by Dr. Mills' work, he decided to go into this new method of examination as a specialty—a pursuit which he followed throughout the remainder of his active medical career.

He has been a member of organized medicine for many years. He held membership in the Radiological Society of North America and the American College of Radiology, and was a Diplomate of the American Board of Radiology. He has made many contributions to the medical literature. He was in charge of the radiology department of Southeast Missouri Hospital and St. Francis Hospital, Cape Girardeau, until his disablement.

It is fitting that the first lecture of this series should be on a radiologic subject.

The first lecture delivered in honor of Carl August Zimmermann, M.D., Cape Girardeau, before the Cape Girardeau County Medical Society, Cape Girardeau, March 5, 1951.

One would think that the criteria for the roentgen diagnosis of intestinal obstruction had been so well established that further discussion would be superfluous. There still remain those, however, especially among surgeons, who are not convinced of the effectiveness of this method of diagnosis and look upon the various patterns of gas distended bowel as confusing and inconclusive. It is true that there are instances in which the findings may be baffling and the diagnosis obscure, but these represent a small minority. In by far the greatest number of cases the roentgen findings, when correlated with the clinical symptoms, point the way to a correct diagnosis.

The conditions to be considered are:

1. Intestinal obstruction (complete).
2. Paralytic ileus (generalized).
3. Spastic ileus (localized).
4. Mesenteric (arterial) thrombosis.
5. Mesenteric (venous) thrombosis.

I have found the following three positions for roentgenographic examination most satisfactory in obtaining the information essential for differential diagnosis of these conditions:

1. Anterior flat film of the abdomen with patient lying prone. This is best to detect the presence of gas dilated loops of bowel and to establish their extent and location.

2. Lateral decubitus with the patient lying on his left side (right side up) and the x-ray beams directed horizontally from behind forward. This serves to show multiple fluid levels in the gas distended bowel and possible exudate between intestinal loops, or it may show gas free in the

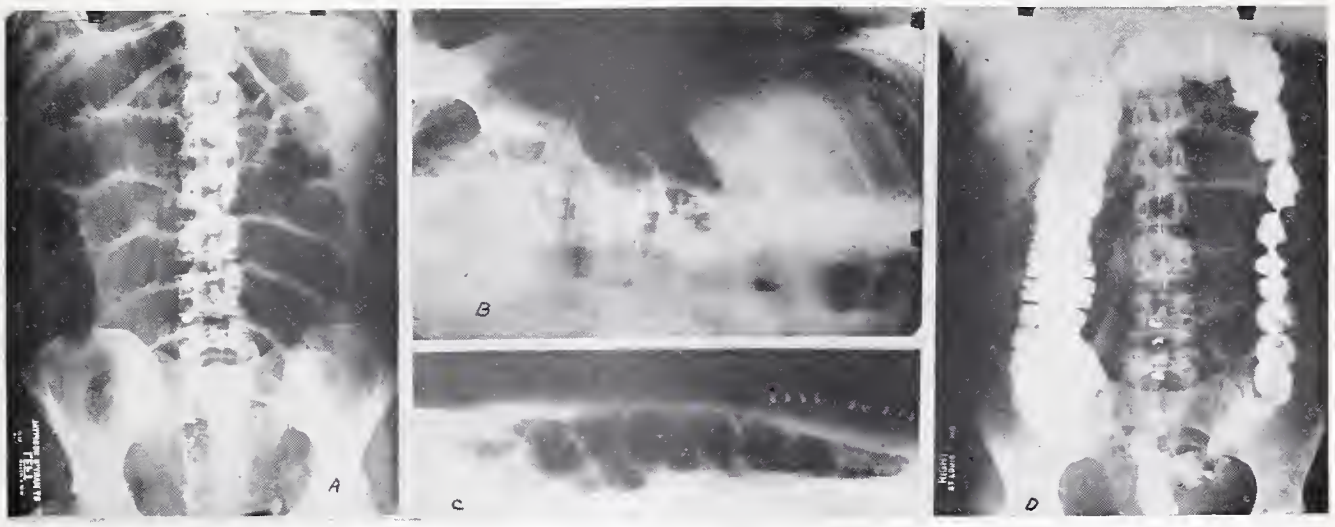


Fig. 1. A. Flat film of abdomen showing complete small intestinal obstruction: gas distended loops of small bowel proximal to obstruction, showing "herring bone" design and "ladder pattern." The bowel distal to the obstruction is flaccid and the rectum is devoid of gas or fecal material.

B. Second position, with patient in lateral decubitus (right side uppermost) and the x-ray projected horizontally. This view serves best to show multiple fluid levels in the bowel and demonstrates any possibility of gas free in the abdomen.

C. Third position, with the patient on his back and the x-ray beam projected horizontally across abdomen from side to side. This transabdominal view serves well to show multiple fluid levels, but is the best position for demonstrating exudate between the intestinal walls.

D. Additional examination by barium enema serves to differentiate the small from the large bowel. In intestinal obstruction the distal portion of the bowel is flaccid and empty; barium enema should disclose relaxed, undistended character of colon.

abdominal cavity, without placing the patient in the upright position.

3. Transabdominal view, patient lying on his back, roentgen ray beam directed horizontally from side to side across the abdomen. This view serves best to show exudate between gas distended loops, multiple fluid levels and may show gas free in the abdomen.

For a more complete understanding of the roentgen signs which develop in these conditions, a detailed knowledge of the underlying physiologic processes which take place is essential.



Fig. 2. A. Paralytic ileus producing extreme gaseous distension of small and large bowel alike; multiple fluid levels are present in this condition also. Note that gas distended loops of bowel have a tendency to produce pressure upon each other, also that entire colon is distended and gas is present in the rectum.
B. Transabdominal view showing multiple fluid levels in gas distended bowel.

INTESTINAL OBSTRUCTION

Physiologic Manifestations Leading to Roentgen Signs

1. *Physiologic Manifestations.*—In intestinal obstruction, hyperperistaltic waves, attempting to overcome the obstruction, affect, not only the proximal portion, but the bowel distal to the obstruction also, stripping it of gas and fecal material and leaving it collapsed and flaccid. It is possible, therefore, to have a bowel movement after obstruction has occurred.

Roentgen Signs.—The intestine distal to the obstruction should not show evidence of feces or gas; the rectum should be free from gas. This is an important differential point (Fig. 1).

2. *Physiologic Manifestations.*—Obstruction prevents natural passage of intestinal material, causing bowel proximal to the obstruction to dilate. Intestinal contents and gas from putrefaction or other causes cannot be absorbed so that the intestinal loops proximal to the obstruction dilate. Any appreciable amount of gas in the small bowel of an adult must be considered as abnormal.

Roentgen Signs.—Gaseous dilatation of the loops of intestine proximal to the obstruction. Overdistention of intestine results in stretching of the valvulae conniventes, imparting a "herring bone" design to the dilated gut. The mesenteric attachment causes the gas distended loops to arrange themselves back and forth across the abdomen in a ladder pattern.

3. *Physiologic Manifestations.*—As the intestines dilate, the blood supply is interfered with because of the interstitial arrangement of the mesenteric arteries and veins within the intestinal wall. At first, the venous return will be shut off, causing edema, and then the arterial supply will be affected.

Roentgen Signs.—Edema caused by interference with the venous return causes fluid to exude into the gut, resulting in fluid levels. Multiple fluid levels in the gas distended bowel is a common but not a characteristic finding in intestinal obstruction. Any condition which causes dilatation of the bowel may result in exudation of fluid into the intestine.

4. *Physiologic Manifestations.*—As overdistention continues, the arterial supply is finally shut off and gangrene results.

Roentgen Signs.—Gases of putrefaction continue the picture of gas distention, with multiple fluid levels. There is no roentgen sign by which the occurrence of gangrene can be determined definitely.

The criteria for diagnosis of complete intestinal obstruction then may be considered as: gas distended intestinal loops of bowel proximal to the obstruction presenting a "herring bone" design and "ladder pattern"; flaccidity of bowel distal to obstruction as indicated by lack of fecal content or gas in distal segment or rectum. Multiple fluid levels in the gas distended bowel is a finding which is dependent upon the distention of the bowel from whatever cause. Pain is cramp like in character and is intermittent. It is never so sévere that it similates an acute abdominal emergency.

PITFALLS IN DIAGNOSIS OF INTESTINAL OBSTRUCTION

1. Failure to properly identify the character and location of gas distended intestinal loops. Barium enema will differentiate the large from the small bowel and will demonstrate the flaccid empty status of the colon. It may even indicate the location of the obstruction. The lack of gas distention of the rectum and its flaccid state offer a good clinical point in differentiating between intestinal obstruction and paralytic ileus.

2. Evacuation of gas from the rectum by rectal tube or cleansing enema immediately before x-ray examination. Since so much depends on identification of gas in the rectum for differentiation between intestinal obstruction and paralytic ileus, it is well to ascertain these points in case of any doubt. Use of the Wangensteen apparatus or Miller-Abbott tube may modify the picture so as to introduce an error in diagnosis. Such procedures should not be employed until after the diagnosis is made.

3. Prevention of gas from entering the rectum. If because of pressure from pelvic tumors, pelvic cellulitis or other infection, blood filling the pelvis as in ruptured tubal pregnancy or any other process which may compress the rectum may give a false impression of flaccidity of the rectal structures.

4. Differentiation from localized spastic ileus. This condition may produce isolated gas distended loops of bowel without any obstruction but the loops of bowel are always smaller than in intestinal obstruction and there is always some associated pain. A more generalized spastic ileus may occur in similar conditions in which there is agonizing pain such as ruptured tubal pregnancy, or ruptured ulcer. The roentgen picture may be strikingly similar, but the extreme pain is out of all proportion to that seen in simple intestinal obstruction.

PARALYTIC ILEUS

Paralytic ileus is, as its name implies, due to nervous inhibition of the intestinal musculature. It affects the entire bowel, large and small. It usually occurs as the result of an insult to the peritoneum from excessive handling of the in-

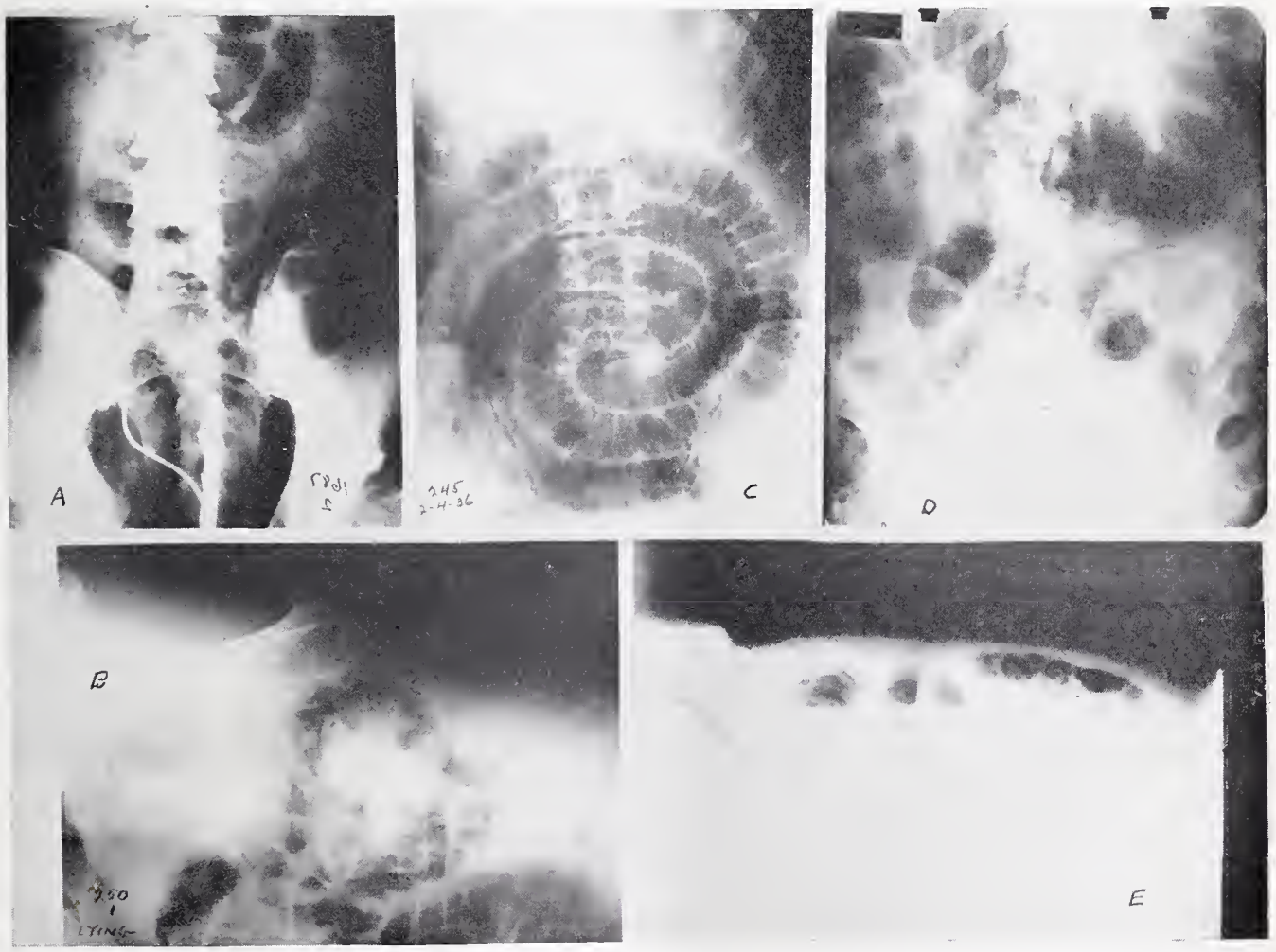


Fig. 3. A. Localized spastic ileus from pain associated with passage of a urinary stone or catheter. Spastic ileus may be local or general; it is caused by reflex inhibition of intestinal movement often in isolated loops, always associated with pain with or without peritoneal infection.
B. Localized spastic ileus caused by inhibition in movements of the gut surrounding an appendiceal abscess.
C. Mesenteric (Richter's) hernia caused by a small knuckle of bowel herniating into a hole in the mesentery. Extreme pain results with production of a double loop of gas distended bowel forming circular intestinal patterns in the abdomen.
D. Generalized spastic ileus without evidence of gas in the rectum, in a patient with perirectal abscess—this gives an appearance which could easily be mistaken for intestinal obstruction.
E. Gas distended intestines with large amounts of peritoneal exudate between the loops, as seen in the transabdominal view. This is the best view for demonstration of such exudate.

testine at operation, or as a result of irritating infection such as peritonitis.

Physiologic Manifestations Leading to Roentgen Signs

1. *Physiologic Manifestations.*—As a result of muscular inhibition there is stagnation of the bowel content, and large quantities of gas develop at first from putrefaction and later because of interference with the ordinary gaseous absorption.



Fig. 4. A. Mesenteric (arterial) thrombosis before it has become well established shows bizarre appearance of gas distribution. This in itself is suggestive of the condition.

Roentgen Signs.—Generalized gaseous distention of the entire bowel, small and large alike. The rectum is distended with gas. Since the musculature of the bowel has lost its tone, the gas distended loops appear more as structureless sacs pressing upon each other (Fig. 2).

2. *Physiologic Manifestations.*—The fluid seeps back into the bowel since the process of edema from gaseous dilatation and obstruction of venous return is the same as in intestinal obstruction.

Roentgen Signs.—Multiple fluid levels occur within the gas distended bowel just as in obstruction.

CONDITIONS TO BE NOTED IN PARALYTIC ILEUS

1. In paralytic ileus the recognition of the gaseous distention of the entire bowel, including the rectum and colon, is of greatest importance.

2. A barium enema may be necessary to determine this point; the colon will show pronounced dilatation in place of flaccidity as in obstruction.

3. There is no severe pain from uncomplicated paralytic ileus other than discomfort of gaseous distention.

LOCALIZED SPASTIC ILEUS

This condition results from some unusual stimulation of the sympathetic nerves such as pain from passage of ureteral stone or insertion of ureteral catheter, abdominal infection such as appendiceal abscess.

Physiologic Manifestations Leading to Roentgen Signs

1. *Physiologic Manifestations.*—A segment of gut may lose its normal motility from spastic inhibition failing to transmit peristaltic waves although no actual obstruction is present and the gas remains trapped in the isolated loops.

Roentgen Signs.—Isolated gas filled intestinal loop, usually relatively small in character and limited in extent (Fig. 3).

2. *Physiologic Manifestations.*—Some unusual sickly pain, but usually not too severe.

Roentgen Signs.—The caliber of the gas filled bowel never reaches the same size as in obstruction, which helps differentiate the condition. This

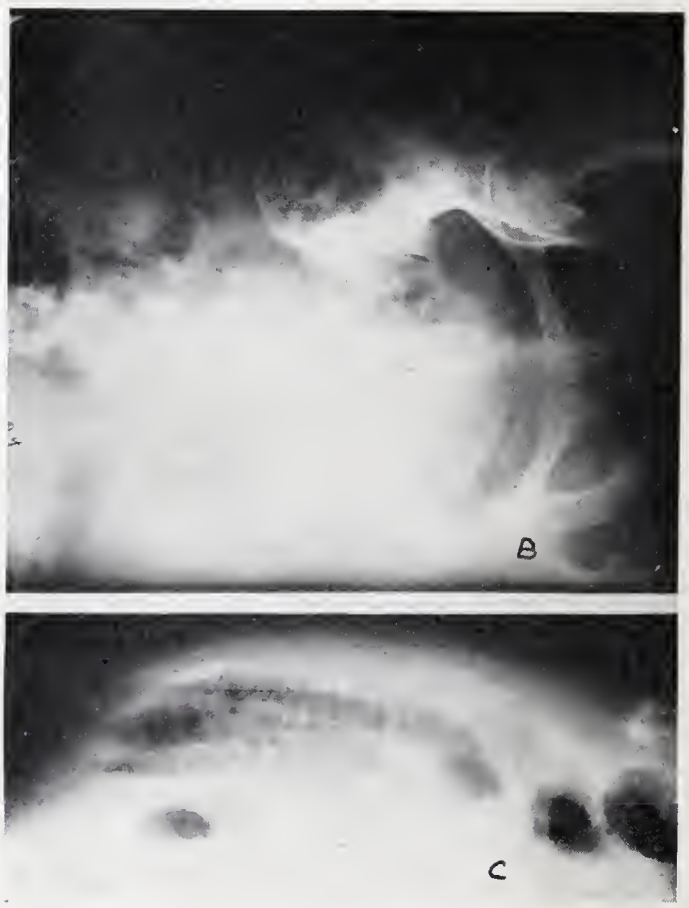


Fig. 4. B. Lateral decubitus view showing unusual appearance of gas pattern.
C. In the transabdominal view, likewise, the gas pattern is unusual in appearance.

is an all important point in the differentiation of this condition from obstruction.

CONDITIONS TO BE NOTED IN LOCALIZED SPASTIC ILEUS

1. Extent and location of intestinal dilated loops; usually small and isolated.

2. Its degree of distention; relatively slight dis-

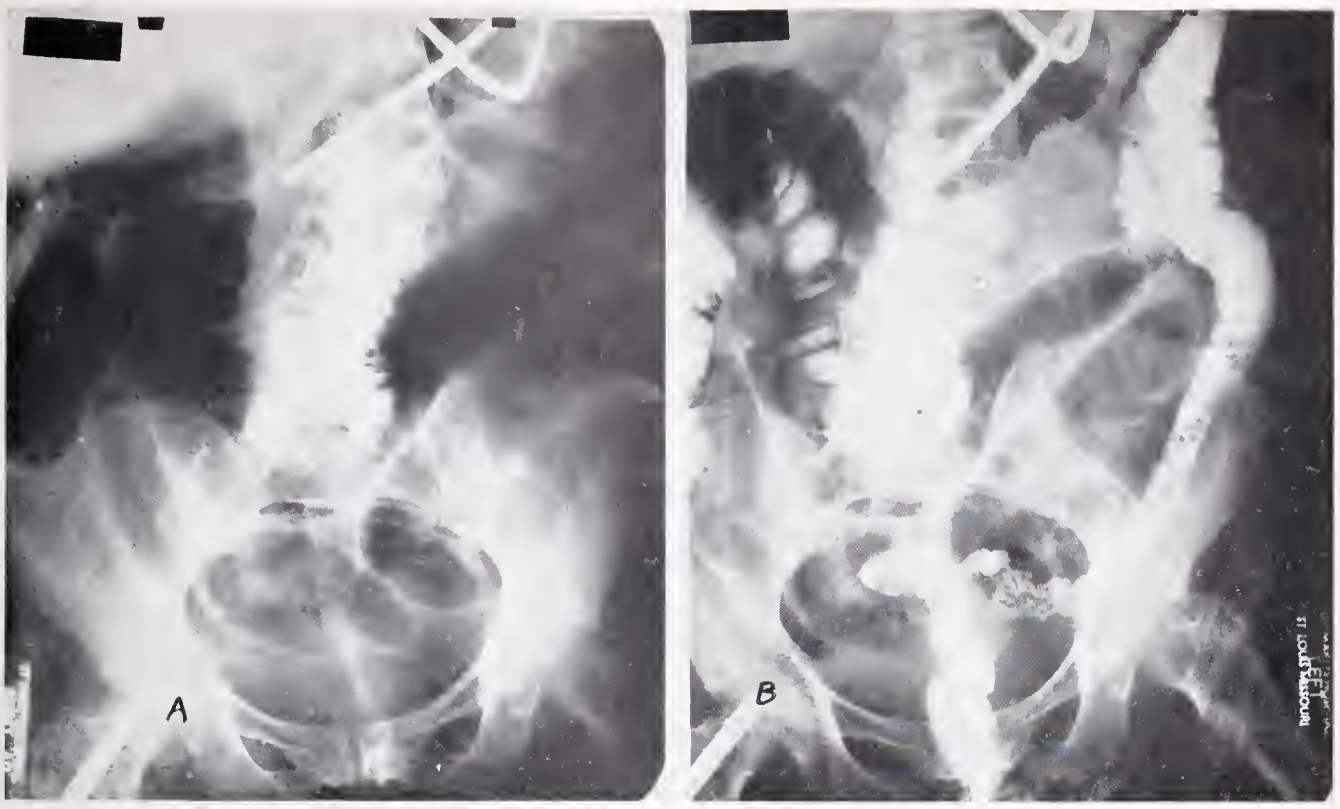


Fig. 5. A. Mesenteric arterial thrombosis (advanced stage) producing gaseous distention of both small and large bowel up to the region of the splenic flexure of the colon, without gas in the descending colon or rectum, giving a picture similar to that of intestinal obstruction.
B. Barium enema failing to reveal any evidence of obstruction in region of splenic flexure, indicating that the condition is due to mesenteric (arterial) thrombosis.

tention in comparison with that seen in intestinal obstruction or paralytic ileus.

3. The presence of a condition causing some degree of pain that may account for the local spastic ileus, such as passage of a renal or gall stone, local peritoneal abscess or other infection, trauma.

ARTERIAL MESENTERIC THROMBOSIS

This is a condition in which the blood supply to the intestine is suddenly cut off. The superior mesenteric artery, which is usually affected, supplies the entire small intestine and colon up to the region of the splenic flexure, a condition which is reflected in the findings. It produced severe abdominal symptoms indicating an acute abdominal condition (Laufman, Martin and Tuell).

Physiologic Manifestations Leading to Roentgen Signs

1. *Physiologic Manifestations.*—Arterial mesenteric thrombosis is attended with agonizing pain and collapse. The initial reaction is intense contraction of all intestinal musculature causing "curling of bowel."

Roentgen Signs.—No demonstrable roentgen signs are evident at the onset.

2. *Physiologic Manifestations.*—This is soon followed by relaxation of bowel musculature and formation of gas in the intestines.

Roentgen Signs.—Gas collection in the bowel may be slight for a considerable time; the distribution is often bizarre in appearance at the onset (Figs. 4 A, B, C).

3. *Physiologic Manifestations.*—Gaseous distention increases since there is no venous drainage to carry it off; the distribution is seen to involve the entire small intestine and colon up to the splenic flexure, constituting the distribution of superior mesenteric artery.

Roentgen Signs.—Gaseous dilated loops of bowel fully as large as those seen in intestinal obstruction may ultimately develop, affecting the entire small bowel and colon up to splenic flexure. The appearance may be almost identical with that of a complete bowel obstruction in the region of the



Fig. 5. C. Multiple fluid levels were seen in both transabdominal and lateral decubitus views; these are due to blood which seeps back from the veins when muscular spasm of the bowel relaxes.

transverse colon near the splenic flexure (Figs. 5 A, B, C).

4. *Physiologic Manifestations.*—Relaxation of bowel musculature some time later allows blood from engorged veins to seep back into intestinal



Fig. 6. A. Venous mesenteric thrombosis showing almost complete lack of gas formation. Entire abdomen shows a homogenous appearance due to waterlogging edema.

lumen, from which it may be passed in a bowel movement. Bloody stools in a patient having the roentgen picture similar to obstruction of the bowel in the region of the splenic flexure must always be considered as possibly due to mesenteric (arterial) thrombosis.

Roentgen Signs.—Fluid levels develop within the gas distended bowel, but these are scantier and are due to blood. Picture may resemble intestinal obstruction at splenic flexure. Barium enema shows distal bowel flaccid and indicates no obstruction at splenic flexure where it appeared as if an obstruction might be.



Fig. 6. B. In the lateral decubitus view only a small amount of gas is seen.
C. Also in the transabdominal view, there is almost complete absence of gas.

POINTS IN DIAGNOSIS

1. The entire process is attendant with extreme pain and shock; indicating an acute abdominal condition, not at all like the mild, intermittent, colicky pain of obstruction or the distended feeling accompanying paralytic ileus.



Fig. 7. A. Venous mesenteric thrombosis showing almost complete lack of gas; only small amount is seen in the undistended transverse colon.
B. Lateral decubitus position also; only a small amount of gas was visible. (Courtesy of Dr. W. K. Mueller).

2. At first the pattern of gas distended bowel is bizarre.

3. Later it assumes size and appearance of an intestinal obstruction in the region of the splenic flexure of the colon; the gas distended bowel may be traced from the region of the splenic flexure back through the entire small intestine.

4. Barium enema will disclose patency of the colon at the site in splenic flexure where there was apparent obstruction (Rendich and Harrington).

5. Fluid levels are not as pronounced; they are due to blood. Bloody stool, when it occurs, is more or less characteristic of this condition.

VENOUS MESENTERIC THROMBOSIS

Venous mesenteric thrombosis is not attended with intestinal spasm. It may be attended with severe pain but there is no spasm of the gut. On the other hand, the intestine becomes boggy with edema and lies limp in the abdomen; exudate pours out into the interstitial tissues of the gut, into its lumen and finally even into the abdominal cavity. The clinical picture is similar to that produced by continuous slow bleeding. There is no gas distention of the bowel and, therefore, no fluid levels are visible (Laufman and Scheinberg).

Physiologic Manifestations Leading to Roentgen Signs

1. *Physiologic Manifestations.*—Initial reaction is attended with intense pain, but spasm of the musculature of the intestine is not present. The bowel just lies there inert.

Roentgen Signs.—No demonstrable roentgen signs at first (Fig. 6).

2. *Physiologic Manifestations.*—Waterlogging edema of the bowel results from lack of venous return, and plasma pours into intestines filling the lumen without gaseous distention. Ascites develops.

Roentgen Signs.—Waterlogged edema of bowel plus abdominal fluid produces a dense, homogeneous shadow throughout. Gas distended loops of bowel are conspicuous by their absence. A few small collections of gas may be present but these are minimal (Goldman and Rives) (Fig. 7).

3. *Physiologic Manifestations.*—Patient's condition progresses rapidly downhill with same symptoms as if he were bleeding.

SUMMARY

1. The radiologic findings are explored in the light of the physiologic processes involved in various intestinal lesions.

2. Differential manifestations are discussed and illustrated in:

Complete intestinal obstruction.
Paralytic ileus.
Localized spastic ileus.
Acute mesenteric (arterial) thrombosis.
Acute mesenteric (venous) thrombosis.

3. Correlation of clinical symptoms and roentgen findings serve to differentiate these conditions.

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NEW TYPE NEEDLE REDUCES SPINAL ANESTHESIA HEADACHE

Lessening of headaches following spinal anesthesia with the use of a new needle in the administration of the anesthetic was reported in the October 13 *Journal of the American Medical Association.*

The needle, much finer and smaller than the customary one, has a sharpened, pencil pointlike tip, according to the authors of the article, Drs. James R. Hart and R. J. Whitacre, of the department of anesthesiology of the Huron Road Hospital, East Cleveland, Ohio.

Although a multitude of theories have been given for the causes of such headaches, Drs. Hart and Whitacre stated it is generally believed they follow leakage of cerebrospinal fluid through the puncture hole made by the needle in the outermost membrane of the spinal cord. This loss of fluid support from the brain is believed to cause tension on blood vessels and brain nerves, resulting in a headache.

In a test, 2,070 patients were administered spinal anesthesia with an ordinary needle. One hundred and three of them (5 per cent) complained of the typical spinal type of headache, the report stated. Of 3,489 patients on whom the pencil point type needle was used, only 69 (2 per cent) developed headaches.

The headache which occurred following the use of the pencil point needle were, for the most part, shorter in duration and of less severity than those after use of the customary needle, the report added.

"These results are encouraging and lend support to the opinion of earlier workers that such an approach may point the way toward a means whereby the percentage of postspinal headaches can be reduced," the doctors stated.

However, they added much more experience will be needed to confirm these findings.

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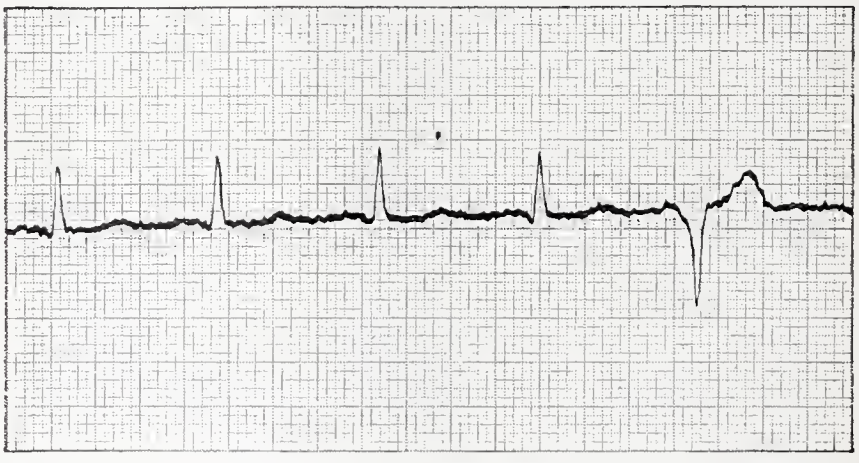
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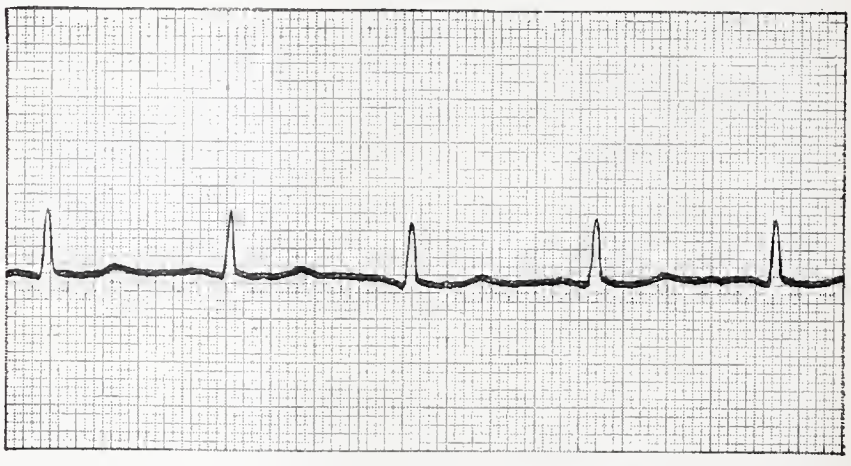
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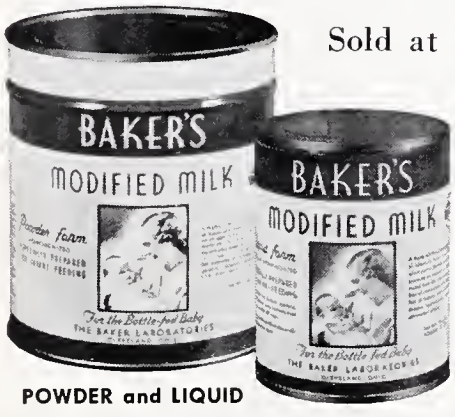
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Clinical Conference

CLINICAL PATHOLOGIC CONFERENCE

TWENTY-NINE FIVE YEAR SURVIVORS OF CANCER OF THE LARGE INTESTINE AT FIRMIN DESLOGE HOSPITAL

FRANCIS J. BURNS, M.D.
ST. LOUIS
AND
JAMES W. CLAWSON, M.D.
ST. LOUIS

F. J. Burns, M.D.: This conference deals with cancer of the colon and rectum in view of twenty-nine patients surviving treatment five years or longer. Though small, the group indicates that 40 per cent of large intestine cancer patients have survived five years or longer (table 1).

Table 1. *Five Year Survivors of Cancer, Firmin Desloge Hospital, 1933-1946*

Site of Cancer	Per Cent Surviving	Number Surviving	Number Surviving Operation	Number Operated Upon	Number Seen
Breast	48	41		85	116
Lower lip.....	44	12		27	
Rectum, colon.	40	29	73	95	240
Buccal mucosa	27	3		11	
Mouth	20	2		10	
Cervix uteri..	14	16	112		
Stomach	10	1	10	21	157
Tongue	0	0	10		
Lung	0	0			23
Melanoma	?	2			

The age of the twenty-nine survivors of colon and rectal carcinoma averaged 56 years, the same age for the sixteen females as for the thirteen males. The youngest was a man of 29, the oldest 79 when operated upon.

Change in bowel habit was the most common symptom, being noted by twenty-four patients. Next commonest was bleeding by rectum, noted by twenty-three patients; next, weight loss, thirteen patients. One patient, losing sixty pounds preoperatively, is surviving more than five years despite so large a loss in weight.

Less common symptoms are listed in table 2.

Table 2. *Less Common Findings: Twenty-nine Cases of Large Bowel Cancer*

Pain	12	Weakness	5
Anemia	10	Obstruction	5
Pruritus ani.....	8	Vomiting	3
Anorexia	6	Ribbon stools	1

The tumor was found accidentally at laparotomy in two patients. Three patients had hemorrhoidectomy, one sclerosing treatment for hemorrhoids prior to surgery for carcinoma. Other clinics have reported a higher percentage of such unwarranted procedures prior to definitive surgery.

The average duration of symptoms and signs for the twenty-nine patients was nine months, a time lag in agreement with reports from other clinics. So long a delay prevents an early diagnosis in many patients. One must remember that early cancer of the rectum or colon is asymptomatic and that even the commonest symptoms, such as altered bowel habit or bleeding, indicate cancer often advanced in stage, even though still curable.

J. W. Clawson, M.D.: I was impressed by the fact that twenty-three of the twenty-nine patients had rectal bleeding of some degree. Ten of the patients on admission to the hospital had red blood counts below 4 million, most of them with cancer in the right or transverse colon, as might be expected.

The tumor was within reach of the finger or sigmoidoscope in twenty of the twenty-nine patients (fig. 1), representing 70 per cent of the group. Of the remaining nine patients, seven were diagnosed by barium enema and two at laparotomy. It was interesting that one patient had a rectovaginal fistula due to carcinoma primary in the rectum.

All tumors were adenocarcinoma, none squamous cell carcinoma in type.

Dr. Burns: Of the twenty-nine patients, twenty survive more than five years following abdominoperineal excision of the Miles type. Seven patients survive resections of the right or transverse colon, and two patients survive resections of the left colon. Three patients survive either anterior resection of the Hartmann type, or Lockhart Mummery or Kraske posterior resections. Finally, three patients survive mere fulguration or local excision of histologically verified adenocarcinoma. It was interesting that no patient with cancer of the sigmoid or pelvic colon above reach of the proctoscope survives five years, a record which will undoubtedly improve as the series in the future grows larger in size. The fact remains that cancer of the right colon, with seven survivors, was more readily controlled than cancer of the left colon, with but two survivors. A list of the twenty-nine five-year survivors appears in table 3.

It is, I think, significant that the largest number of survivors of rectal cancer had abdominoperineal resections of the Miles type. Other types of operation for cancer of the rectum yielded a poorer prognosis than the Miles procedure and, consequently, are done infrequently at Firmin Desloge Hospital.

The case histories of the three patients surviving five years or longer following simple fulguration or local excision of histologically verified rectal adenocarcinoma follow.

REPORT OF CASES

Cancer of Rectum, Six Year Survivor
(S. J. Freund, M.D.)

Case 1. Mr. R. F., aged 47, in 1942 complained only

Tumor Teaching Conference, No. 133, June 28, 1951.
From the St. Louis University School of Medicine, aided in part by Grant CT 619, U.S.P.H.S., and the Missouri Division of the American Cancer Society.

of bleeding. On proctoscopy a polyp was visualized 15 cm. above the anal verge and biopsied.

Pathology.—Adenocarcinoma.

The polyp was fulgurated. The patient survived the sixth year, 1948, symptom free, when last heard from. No colostomy was necessary.

Cancer of Rectum, Seven Year Survivor (W. G. Marston, M.D., V.T. Eberle, M.D., F. J. Burns, M.D.)

Case 2. Mrs. P. L., aged 70, in 1945, had chief complaint of constipation for five years duration.

Present Illness.—There was bright blood in the stools at irregular intervals of two years duration. When constipation was severe, stools became dark and tarlike. She had pain at night in the right lower quadrant, localized under the right scapula. There was no weight loss.

Past History.—She had had an operation for abscess of the left tube, and nonfunctioning right kidney.

Family History.—There was no history of carcinoma.

Physical Examination.—Her weight was 134. The patient appeared well. There was a suprapubic scar, no mass. Examination of the rectum showed a papilloma 5 cm. above the anus, which appeared polypoid.

Clinical Diagnosis.—Papilloma of the rectum.

Procedure: Proctoscopy, biopsy, barium enema.

Pathologic Diagnosis.—Malignant adenoma (?). Adenocarcinoma (on biopsy).

X-ray.—Diverticulosis of the sigmoid.

Operation.—On March 23, 1945, a sessile polyp on the anterolateral wall of the rectum 12 cm. above the anorectal line was found. The liver was normal. Peritoneum around the rectum was freed and raised and resutured to the sigmoid at the level of the fundus uteri, thus raising the peritoneal floor above the level of the tumor with a view to subsequent fulguration of the polyp.

Second Operation.—On April 7, 1945, the tumor was fulgurated via the operative proctoscope.

Pathologic Report.—Adenocarcinoma of the rectum (rectosigmoid).

Follow-up.—Alive and well in the seventh year. No colostomy proved necessary.

Table 3. *List of Twenty-nine Five-Year Survivors Firmin Desloge Hospital, 1933-1946*

1. Twenty in reach of finger or proctoscope.
   A. Abdominoperineal excision, 14 patients:
      Mrs. P. L., 46—1936-50. OK
      Mrs. A. H., 61—1942-51. OK
      Mr. J. P., 46—1942-51. OK
      Mr. G. S., 56—1943-51. OK
      Mrs. L. S., 50—1942-50. OK

      Mr. J. S., 29—1943-51. OK
      Mr. C. P., 56—1943-51. OK
      Mrs. B. S., 50—1943-51. OK
      Mrs. L. B., 61—1934-44. x 10th year
      Mrs. S. A., 52—1936-41. x 6th year

      Mr. J. F., 66—1937-51. OK
      Mrs. M. P., 69—1945-51. OK
      Mr. C. M., 51—1945-51. OK
      Mrs. M. F., 41—1933-39. x 6th year
   B. Anterior resection (Hartmann), 1 patient:
      Mr. M. O., 79—1933-42. x 7th year
   C. Lockhart Mummery, 1 patient:
      Mrs. M. D., 60—1936-50. OK
   D. Kraske, 1 patient:
      Mrs. J. H., 63—1936-51. OK
   E. Local excision, only, 3 patients:
      Mr. R. F., 47—1942-48. OK
      Mrs. P. L., 70—1945-51. OK
      Mr. J. J., 79—1942-49. OK
2. Nine above reach of proctoscope.
   A. Resect left colon, 2 patients:
      Mr. L. F., 58—1936-47. x 9th year
      Mr. C. A., 56—1945-51. OK
   B. Resect right colon. 7 patients:
      Mr. W. D., 42—1945-50. OK
      Mrs. E. W., 67—1941-51. OK
      Mr. T. R., 68—1937-51. OK
      Mrs. O. W., 48—1942-51. OK
      Mrs. J. D., 63—1946-51. OK
      Mrs. F. W., 39—1945-51. OK
      Mrs. F. F., 68—1945-51. OK

Cancer of Anus (Mucoid), Seven Year Survivor (Thomas Parker, M.D.)

Case 3. Mr. J. J., aged 79, had bleeding at stool in 1942.

Present Illness.—Bleeding and pain.

Physical Examination.—Large prolapsed and thrombosed internal hemorrhoids were found, plus a mass.

Diagnosis.—Epidermoid carcinoma of the anus.

Operation.—On December 18, 1942, a pedunculated, firm mass at the anus, left lateral, anterior border 2 cm. in diameter, was excised. There was no rectal excision and no colostomy.

Pathologic Report.—Mucoid carcinoma.

Follow-up.—Alive and well in the seventh year.

Dr. Burns: Because patient 1 was blind, it was thought undesirable to leave him with a colostomy; therefore his tumor was merely fulgurated and he now survives six years.

Patient 2, a woman of 70, absolutely refused a colostomy. Fulguration has controlled her cancer for seven years.

With patient 3, I am not directly acquainted. His tumor, arising in the anal canal was a mucinous adenocarcinoma histologically. Possibly his physical condition did not permit more radical operation than local excision, which has been followed by survival now for seven years.

By contrast with these three early patients, Dr. Houston will discuss a patient, the most advanced cancer to be followed by a five year survival. This patient had a double primary cancer.

Double Colon Cancer, Nine Year Survivor (Dean Sauer, M.D., W. K. Mueller, M.D.)

Case 4. Mrs. O. W., aged 48, had a lump in the right side, of two weeks duration.

Present Illness.—She had occasional pain two months previously on the right side and noticed a lump there two weeks previously. Pain was not severe or constant. The mass was sore to touch and was hard. She vomited but once, had some constipation but no diarrhea. She had a weight loss of 8 pounds and her side became more sore with the pain worse after eating.

Past History.—(May 1938, St. Louis County Hospital, Dr. Sauer). Obstructive resection was done of adenocarcinoma of the sigmoid 2 cm. in diameter which had ulcerated through the left lower abdominal wall and was discharging feces through a spontaneously formed colostomy. Because the tumor had invaded the terminal ileum by direct extension, it was necessary to resect the terminal ileum with an end-to-end anastomosis. (October 1938, St. Louis County Hospital, Dr. Sauer.) For an acute small bowel obstruction, the band was released and the patient recovered.

Physical Examination (1942).—The patient looks well. There was a hard mass the size of a walnut in the right lower quadrant. There was a scar in the right lower quadrant. Rectal examination gave normal findings.

Diagnosis.—Carcinoma of the colon.

Procedure.—Barium enema.

Laboratory Findings.—Red blood count was 5,100,000; Hb. 14.9.

Barium Enema.—Filling defect of the cecum, probably neoplastic.

Operation.—On July 3, 1942, a right hemocolectomy showed an extensive carcinoma of the cecum invading the parietal peritoneum 3 inches in diameter. Liver was normal.

Pathologic Report.—Adenocarcinoma of the cecum.

Follow-up.—This patient was again operated on (September 6, 1947) for metastatic carcinoma of the mesentery of the large bowel and small gut. Resection of the transverse colon and distal ileum with an end-to-side transverse ileocolostomy was performed. There have been no recurrences in the ninth year. Her weight which was 70 pounds is now 135 pounds.

V. T. HOUSTON, M.D.: Dr. Dean Sauer asked me to discuss patient 4 in his absence. Preoperatively, in 1938, she weighed 70 pounds; now in 1951 she weighs 135 pounds, eats well and works in her garden.

Dr. Sauer resected the sigmoid for carcinoma in 1938 and the cecum and right colon for a second primary carcinoma four years later, in 1942. In 1946, he reoperated and successfully removed a carcinomatous implant in the ileum.

J. V. FINNEGAN, M.D.: Does she suffer from diarrhea?

DR. HOUSTON: No. Her bowels move once or twice daily. Merely because the abdomen has been once explored and part of the colon removed for carcinoma should not make one neglect what is thought to be a recurrence. Had Dr. Sauer made such an error, he would have overlooked the second primary tumor of this patient. It may be possible even to remove secondary implants, another point this patient's history illustrates.

J. E. JENSEN, M.D.: How do you follow patients like this? Do they return at definite intervals? Do you advise recheck by x-ray periodically?

DR. HOUSTON: This particular patient diagnosed her second primary lesion herself.

E. L. KEYES, M.D.: Possibly yearly barium enemas and yearly rectal digital and proctoscopic examinations would be in order for such patients. Personally, I like to see such patients at intervals of three months for five years, yearly thereafter.

Do you recall the double simultaneous cancer in a patient of J. W. Thompson, M.D., Dr. Cassidy?

L. D. CASSIDY, M.D.: Yes, I believe the patient, in her 80's, had simultaneously cancer both in the right and in the left colon, diagnosed by barium enema and successfully removed.

DR. HOUSTON: Recently I saw a patient with a triple primary colon carcinoma, one in the right colon, one in the sigmoid and one in the rectum.

DR. KEYES: Many of us have seen double, even triple primary colon carcinoma, undoubtedly originating on the basis of multiple polyps. Would Dr. Thomas care to review some of his figures from the Homer G. Philips Hospital?

J. J. THOMAS, M.D.: From 1946 to 1950, seventy-five cases of cancer of the colon were analyzed at Homer Philips Hospital, all proven cases. Seventy-five cases were studied and of these fifty-six were operated upon. Thirty-one of the fifty-six had definitive surgery and lived from one to five years after surgery. Four of those having definitive surgery died within seventy-two hours after operation of cerebral hemorrhage, postoperative shock and pulmonary embolism. There is no follow-up on seven who had definitive surgery. Seven patients who had palliative surgery died within five months, three having palliative surgery lived from four to five months. On three having palliative surgery, there is no follow-up. One patient who had palliative surgery (exteriorization) died within seventy-two hours after surgery.

A. N. VAUGHN, M.D.: In the absence of definite statistics I may state that a good number of patients have survived at St. Mary's Infirmary, the best example having been presented the last time a conference was held there. This patient now is surviving in her eleventh year, being in her middle 30's when resected, now in her late 40's.

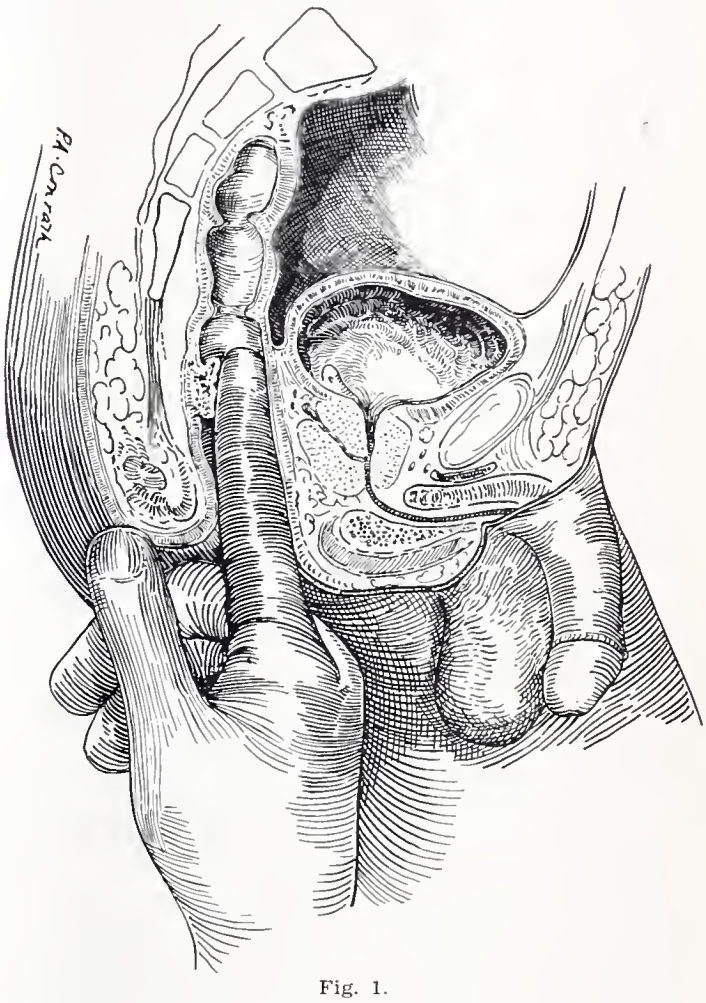


Fig. 1.

She had three operations, her first for adnexal disease, her second for supposed appendicitis. At the third operation she was completely obstructed with cancer in the midportion of the ascending colon. I did a two stage operation, decompressing her first, and ten days later doing a radical right hemicolectomy. She now survives in her eleventh year.

C. R. HANLON, M.D.: I should like to comment on two points which have a direct bearing on five year survival. The first is early diagnosis. We recently performed an exploratory laparotomy in a patient with proved cholecystitis and cholelithiasis. In the discussion before operation, it was noted that she had a so-called secondary anemia. The

discussion brought out the fact that this was not uncommon in carcinoma of the right side of the colon. She had a palpable mass which was thought to be the gallbladder, which at the time of operation proved to be a carcinoma of the hepatic flexure of the colon. She had a resection of the right colon and transverse colon with a cholecystolithotomy. I must confess that it would have been better if this patient had been given a barium enema so that the proper colon preparation could have been initiated before exploration. Fortunately, her postoperative course was smooth.

My second comment has to do with Wangensteen's so-called "second look" in carcinoma of the large bowel. It is particularly important that we should not give the patient up because of recurrence of a primary malignancy since a second procedure may extend the time of survival even though it does not achieve ultimate cure. The question of elective reexploration of gastrointestinal malignancy at some arbitrary interval is still being studied actively by Wangensteen and no conclusions are possible. However, the best results appear to be obtained in carcinoma of the colon.

Dr. Keyes: Dr. Jensen has studied colon patients both here and at St. Mary's Hospital.

Dr. Jensen: My study, completed in 1942, concerned colon disease in general, 79 per cent of it malignant. About 45 per cent of malignancies were found in females and 55 per cent in males. At the time the hospital stay for radical surgery of the colon averaged fifty-three days; now this figure has been cut at least in half.

May I ask Dr. Weir if he knows personally of any patients with colon or rectal cancer surviving five or more years after treatment solely by irradiation?

D. C. Weir, M.D.: No, not to my knowledge. The only carcinoma that comes in the field of radiation is squamous cancer around the anal canal. I know that such tumors have been irradiated and I have done it myself. I only do it under duress. I think surgery is the best treatment. As far as examination with x-ray, I think everyone is familiar with barium enema. Roentgenologists are not responsible for any mass low in rectum and lower sigmoid. That area cannot be seen but the rectum and lower sigmoid should be examined with the finger or proctoscope prior to barium enema. Polypoid lesions and small lesions must be diagnosed with contrast enema. Theoretically it is easy to do, easy to speak about, but actually not easy. One may visualize lesions that appear as polypi and really are not. So it is sometimes easy to speak of those things, but in reality polyps may be difficult to find on x-ray.

Let me recall to you that the diagnosis on another of Dr. Vaughn's patients with colon cancer was missed here at Thanksgiving time because only an upper gastrointestinal series was taken, and the diagnosis was not made at St. Mary's Infirmary until Christmas time when a barium enema finally was made. The point is, that barium enema, not gastrointestinal series, is required for the diagnosis of colon carcinoma.

Dr. Keyes: Mrs. M. F. (table 3) died of inguinal metastases the sixth year after abdominoperineal excision of an adenocarcinoma of the rectum. Inguinal dissection might have saved her. At any rate, inguinal dissection has saved patient 5 now for four and a half years. When I reviewed the subject of inguinal dissections for metastases primary in the rectum (1937)[1] I was able to find no five year survivors.

1. Keyes, E. L.: Squamous Cell Carcinoma of the Lower Rectum and Anus, Ann. Surg. **106**:1046-1058 (December) 1937.

REPORT OF CASE

Metastatic Carcinoma of Rectum, Ten Year Survivor
(E. L. Keyes, M.D., P. D. Stahl, M.D., G. A. Gaikins, M.D.)

Case 5. Mr. J. F., aged 57 (Peoples Hospital), had an excision of the rectum on April 24, 1941.

Pathologic Report.—Squamous carcinoma.

On July 17, 1945, a right inguinal dissection was done.

Pathologic Report.—Metastatic squamous carcinoma.

On December 29, 1946, a left inguinal dissection was done.

Pathologic Report.—Metastatic squamous carcinoma.

To June 28, 1951, there has been no recurrence and the patient clinically is well.

It seems warranted to comment on the fourteen year survival of Mrs. M. D. (table 3) following carcinoma of the rectum causing rectovaginal fistula. The survival of this patient may correct a prevalent opinion that invasion of the rectovaginal septum by rectal cancer is always fatal.

J. P. Wyatt, M.D.: A defect in statistics on carcinoma of the rectum, which I am sure most have thought about, is classification. The bulk of operations are done for grade I lesions. I have talked to a number of pathologists about what is meant by grade I carcinoma. I also have talked to myself. It is often a diagnosis made when the pathologist is frustrated. Knowing the high percentage of survival rate in grade I carcinoma, the question which comes to mind is that perhaps a number of grade I cancers are in reality polyps. A number of criteria exist which can be used to aid in the distinction between cancer and polyps; invasion of the stalk, glands back to back, cytologic conversion of superficial epithelium into "malignant" cells.

I am perplexed by some slides shown this morning; what were these lesions called in the past, and what am I calling them today? Three or four patients apparently have been cured merely by little more than the laying on of hands, i.e., by laying on a hot wire. Apparently these were innocent polyps. Case 4, however, is clear cut carcinoma. Case 1 shows the type of lesions which bothers the pathologist. I should call it a benign polyp. I do not feel these tumors should be placed in the category of cancer. This may be a reason Lockhart-Mummery, Miles and other authors claim an 80 per cent five-year survival rate.

DR. BURNS: I recall that when case 1 was presented before you called it actually cancer, not merely a polyp.

C. F. SHERWIN, M.D.: Mr. T. R. (table 3) was a patient of mine diagnosed as having acute appendicitis; at operation I found some gelatinous matter looking suspicious and removed it for examination. It proved definite carcinoma primary in the cecum, which I resected in 1937 by a Mikulicz operation, and he remains well now in 1951.

It is tragic to see a physician give salves or pills to the cancer patient and tell him he has only bleeding piles. At least make a digital examination, I plead. I have now in the hospital a man I resected last week who had been so treated before the correct diagnosis was made. He had not been bleeding by rectum long, but now he has an extensive lesion for which I could do little.

Some doctors like the so-called "pull-through" operation for rectal cancer, and I have some still living. It does not work as well as the natural anal opening, however.

DR. KEYES: I feel the pull-through operation should be abandoned as it leads either to stricture or to prolapse of the rectum.

DR. BURNS: Our 40 per cent five-year survival rate for cancer of the large intestine, while fairly good, should and will undoubtedly be improved upon in the future. Patients who come to this clinic usually have lesions more advanced than patients able to afford a private physician. The majority of patients at Firmin Desloge Hospital are not of the so-called private patient economic level.

Dr. Allen of Boston stated a few years ago that he was not aware of any cures of colloid cancer of the colon or rectum at the Massachusetts General Hospital irrespective of how extensive the operative procedure might have been.[2] Among our twenty-nine five-year survivors several had mucinous carcinoma.

DR. KEYES: I should like to report a five-year survivor of mucoid carcinoma of the rectum, a woman who eventually died the seventh year of local recurrence. The report follows.

2. Allen, A. W.: Carcinoma of the Large Intestine, Surg. Clin. North America 27:1018-1031 (October) 1947.

REPORT OF CASE

Mucoid Carcinoma of Rectum, Seven Year Survivor
(E. L. Keyes, M.D., F. J. Taussig, M.D.)

Case 6. Mrs. C. G., aged 42, had an excision of the rectum and rectovaginal septum in 1942.

Pathologic Report.—Mucoid carcinoma; origin, rectovaginal septum.

The patient survived seven years and died in 1949 with mucoid carcinoma recurrent in the perineum.

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Case Reports

SECONDARY THROMBOCYTOPENIC PURPURA FOLLOWING QUINIDINE ADMINISTRATION

J. E. PHELPS, M.D.
PATERSON, N. J.

QUINIDINE is one of the cinchona alkaloids and is the dextro-isomer of quinine. The pharmacologic actions of the two alkaloids agree qualitatively but quinidine is less effective against malaria. Both alkaloids lower the contractility of skeletal and cardiac muscle and lengthen the refractory period but with quinidine the depression of contractility is less and the prolongation of the refractory period is relatively greater (Sollman). The fate of quinidine and quinine is similar and according to Bellet, Ravdin and McMillan (1933), when administered by mouth, the capillaries of the liver remove part from the liver and hold it absorbed. Weiss and Hatcher (1927) state that when quinidine is given intravenously, about 95 per cent leaves the blood stream in five minutes and 99 per cent within one hour. Quinidine sulfate is absorbed readily by the intestinal tract. The major part is excreted in the urine. Since quinidine and quinine are related so closely both in structure and pharmacologic action, one is not surprised that they may present many similar toxic reactions.

It was stated by Van der Horst in 1918 that purpura hemorrhagica was not an infrequent symptom of intolerance to large doses of quinine. Since that time several reports have occurred on quinine as the cause of secondary purpura hemorrhagica. There have, however, been only a few reports on quinidine as a cause of secondary thrombocytopenic purpura. It appears that quinidine produces this toxic manifestation with relative infrequency but, because it does occur, this case is presented.

REPORT OF CASE

The patient, a 58 year old white female nurse, presented herself for examination on May 17, 1949. Her chief complaint was almost daily attacks of paroxysmal tachycardia which were relieved by from 3 to 6 grains of quinidine sulfate. The attacks were becoming more severe, however, and were accompanied by considerable precordial distress. Her first attack had occurred five years previously but they were increasing in frequency and severity. The patient stated that she slept poorly and required ½ gr. phenobarbital at bedtime. She had no other complaints.

Previous History.—She had had diphtheria and scarlet fever in childhood and had had a "strep" throat thirteen years ago.

Family History.—Her father died of coronary heart disease at the age of 81. The remainder of the history was noncontributory.

Physical Examination.—Blood pressure was 150/90 in the right arm and 151/90 in the left. Cardiac examination showed a grade one systolic murmur at the apex. There was a regular rhythm and the sounds were of good quality. A-2 was greater than the P-2. The apical rate was 68. There was a slight enlargement to the left.

The chest was normal. The liver and spleen were not palpable and there were no masses, tenderness, rigidity nor ascites. There was one plus edema of the left ankle. The skin showed no eruptions, no rashes and appeared normal.

Fluoroscopy showed the heart hypersthenic in type and there was slight enlargement of the left ventricle; the aorta was slightly widened and the costophrenic angles were clear.

The patient's weight was 164 pounds, height 60¾ inches. Her vital capacity was 1,800 cc.

Electrocardiogram showed high voltage QR_s. There was marked left axis deviation and left ventricular hypertrophy.

Laboratory Examination.—Hemoglobin was 75 per cent, red cells 3,900,000, white cells 8,600, polymorphonuclears 78 per cent, nonsegmented 1 per cent, lymphocytes 18 per cent and monocytes 3 per cent. Blood sugar was 84 mg., blood urea nitrogen 17 mg. and blood cholesterol 216 mg. per 100 cc. of blood. Urine examination was negative for albumin, bile and sugar. Reaction was acid. There were occasional pus cells and specific gravity was 1.018.

The patient was advised to take 3 grains of quinidine sulfate three times a day. Two days later the patient developed diarrhea and abdominal cramps but thought it was due to food until one and a half days later, or, after she had taken a total of 27 grains of quinidine sulfate, when she noticed small petechial areas over all her body and limbs. These increased in number and twenty-four hours later large ecchymotic areas appeared scattered over her body and limbs. She had some oozing from the nasal mucous membrane. She was advised to stop quinidine and phenobarbital immediately.

The patient was admitted to St. Joseph Hospital on May 23, 1949. On the morning of admission she had noticed blood in the urine and in the stools. She still had some abdominal distress but the diarrhea had stopped.

Physical Examination.—Pupils were equal, regular and reacted to light and accommodation. The neck was normal. There were a few petechiae present on the buccal membranes. No rales were heard and resonance and fremitus were normal. There was a grade one systolic murmur at the apex of the heart. Rhythm was regular and the sounds were of good quality. The apical rate was 78. There was slight enlargement of the heart to the left.

The liver and spleen were not palpable. There was no tenderness, rigidity or ascites and no distention of the abdomen. There were no palpable masses.

The skin showed numerous small pin head petechiae over all the body, arms and lower extremities but it was most marked on the legs. There were several ecchymotic areas scattered over the body, arms and legs. Bones and joints were normal and glands were normal. Reflexes were physiologic. There was no edema of the extremities.

On May 24, her blood count showed erythrocytes 4,250,000, leukocytes 5,550, hemoglobin 80 per cent, segmented neutrophils 44 per cent, nonsegmented 7 per cent, small lymphocytes 23 per cent, monocytes 6 per cent. The platelet count was 50,000.

Examination of the patient revealed no increase in the number of petechiae and ecchymotic areas. The patient was still passing considerable blood in the urine. She complained of headaches but stated that

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her abdominal cramps were less. Her liver and spleen were not palpable. No abdominal tenderness was present. Her blood pressure was 140/80.

On May 25, the patient stated that she felt better. She no longer had abdominal cramps and her urine was grossly free of blood. There were, however, two new ecchymotic areas on her right arm. Her blood count was hemoglobin 80 per cent, red cells 4,150,000, white cells 8,000, nonsegmented polymorphonuclears 19 per cent, segmented polymorphonuclears 49 per cent, lymphocytes 29 per cent, monocytes 3 per cent, platelets 30,000, reticulocytes 0.6 per cent. There was marked thrombocytopenia. Clot retraction was 10 per cent of normal. Prothrombin time was 100 per cent of normal. Bleeding time was 2 minutes and 30 seconds and clotting time was 7 minutes.

The bone marrow report was as follows: nucleated cells 63,000, megacaryocytes 22, myeloblasts 3 per cent, promyelocytes 2 per cent, myelocyte neutrophils 24 per cent, metamyelocytes 8 per cent, nonsegmented polymorphonuclears 21 per cent, segmented polymorphonuclears 11 per cent, plasma cells 2 per cent, hematogones 1 per cent, lymphocytes 8 per cent, erythroblasts 5 per cent, normoblasts 15 per cent. The bone marrow showed a normal number of megacaryocytes but these showed no platelet formation. On this date the patient received a transfusion of 250 cc. of blood.

On May 26, she felt much better generally but complained of tachycardia on sitting up in bed. The petechiae were disappearing and there was less blood in the urine on microscopic examination. Her stools were still slightly tarry. Her abdominal distress had disappeared. Her liver and spleen were not palpable. The blood count on this date showed a red count of 4,250,000, white cells 7,000, segmented neutrophils 46 per cent, nonsegmented cells 7 per cent, small lymphocytes 22 per cent, large lymphocytes 21 per cent, monocytes 4 per cent, hemoglobin 86 per cent, platelet count 80,000.

The patient's condition continued to improve and her stool and urine became negative for blood.

On May 31, the platelet count was 260,000, red cells 4,660,000, white cells 5,950 and a normal differential count. Blood urea nitrogen was 16.5. The patient was walking and petechiae were still disappearing.

On June 2 the patient's blood pressure was 140/90 and the petechiae were continuing to fade. The general condition of the patient was good. She continued to make an uneventful recovery and was discharged from the hospital.

On June 7 the hemoglobin was 88 per cent, red count 4,460,000, white count 8,800, segmented polymorphonuclears 56 per cent, nonsegmented 5 per cent, lymphocytes 28 per cent, monocytes 9 per cent, eosinophils 2 per cent, normal cell morphology. Platelet count was 220,000.

On July 7 the hemoglobin was 87 per cent, red count 4,380,000, white count 6,200, segmented polymorphonuclears 47 per cent, nonsegmented polymorphonuclears 6 per cent, small lymphocytes 23 per cent, large lymphocytes 18 per cent, monocytes 9 per cent, platelet count 220,000.

SUMMARY

A case of a 58 year old white female who developed a secondary thrombocytopenic purpura with gross evidence of bleeding in the urine and stool and bleeding from the nasal mucous membrane following the administration of a total of 27 grains of quinidine sulfate over a period of three days is presented.

The patient made a complete and prompt recovery on the withdrawal of the drug.

It is probable that the patient became sensitized to quinidine sulfate through her occasional use of the drug previously.

203 Park Avenue.

AURICULAR FIBRILLATION AND CARDIAC FAILURE

ITS TREATMENT WITH QUINIDINE SULFATE

MICHAEL BERNREITER, M.D.
KANSAS CITY
AND
JAMES W. FOWLER, M.D.
KANSAS CITY

Auricular fibrillation reduces the output of the heart by about 40 per cent. Frequently the appearance of auricular fibrillation is followed shortly by symptoms of congestive failure. Intra-auricular thrombus formation with subsequent embolic phenomena is an ever present danger as long as the auricles fibrillate. Symptoms of palpitation even in digitalized patients often lead to severe cardiac neurosis.

The toxic manifestations of quinidine commonly encountered are nausea, anorexia, vomiting, headache, tinnitus, syncope and peripheral vascular collapse. It has been stated that it is justifiable to conclude that embolism occurs less frequently under quinidine therapy than under ordinary treatment. In two hundred cases of auricular fibrillation without quinidine, Viko, Marvin and White observed nine instances (4.5 per cent) of embolic phenomena, while in 484 cases of auricular fibrillation treated with quinidine, emboli occurred in fifteen cases (3.1 per cent).

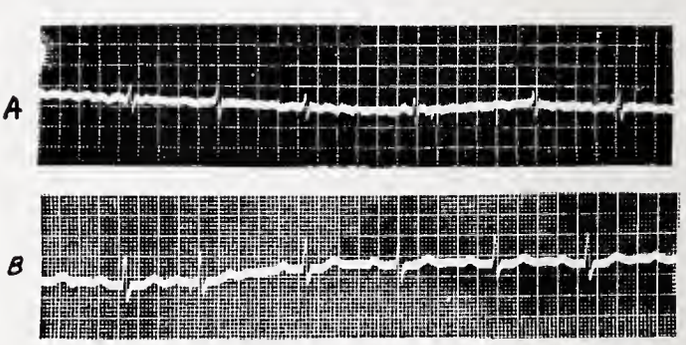


Fig. 1. Female, aged 54, rheumatic heart disease. A. Auricular fibrillation; five hospital admissions for cardiac failure in spite of persistent and complete digitalization. B. Regular sinus mechanism after administration of 60 grains of quinidine sulfate within twenty-four hours. Digitalis discontinued. No further signs of decompensation.

The contraindications to quinidine in our opinion are bacterial endocarditis, complete heart block and angina pectoris relieved by fibrillation. Other contra-indications frequently mentioned in the literature, although present in some of our patients, produced no serious complications. The in-

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crease in cardiac efficiency and reduction in degree of failure after restoration to normal rhythm fully justifies the risk. The administration of quinidine to abolish auricular fibrillation sometimes produces remarkable improvement in patients with congestive failure.

Six unselected cases of auricular fibrillation were used in this study. All were known to have well established auricular fibrillation for at least two months and some for more than two years.

All patients were given a test dose of 3 grains of quinidine sulfate. If no toxic manifestations occurred the patient was usually given 3 grains every four hours day and night. After twenty-four hours unless normal sinus rhythm occurred or unless toxic symptoms appeared, the dose was increased to 6 grains every four hours and the next day 9 grains every four hours. The highest dose administered to a single patient within twenty-four hours was 54 grains of quinidine. After reversion to normal rhythm all patients were placed on a maintenance dose of the drug.

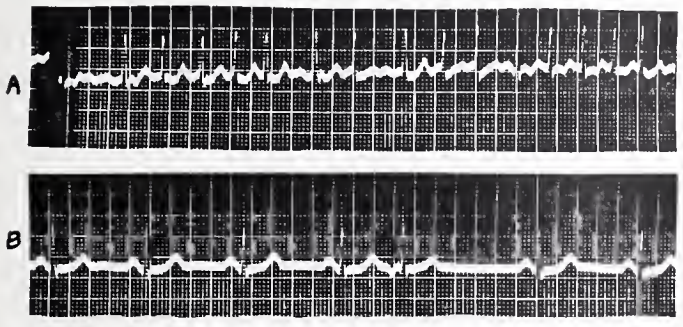


Fig. 2. Female, aged 60, hypertensive cardiovascular disease. A. Auricular fibrillation, cardiac failure, poor response to digitalis. B. Regular sinus rhythm after 45 grains of quinidine sulfate, administered in twenty-five hours; no signs of heart failure for last twelve months. The fifth beat in tracing is an auricular premature contraction.

The average maintenance dose to maintain normal rhythm was 6 grains per day.

Quinidine lowers the T waves in the electrocardiogram and may reverse their direction. The QRS duration, the PR interval and the QT interval may be prolonged. Quinidine is rapidly absorbed and excreted and its effect on the electrocardiogram lasts only a few days with oral administration. All traces of the drug disappear in from twelve to twenty-four hours. With repeated doses the effects are additive.

REPORT OF CASES

Case 1. A white female, aged 54, was critically ill on admission to the hospital. She had rheumatic heart disease at the age of 15 and irregular heart action for at least fifteen years. There were six hospital admissions in the last five years for cardiac failure with continuous digitalization for at least three years. Peripheral edema, dyspnea and orthopnea were present on admission. Cardiac failure occurred in spite of complete digitalization and diuretics. Electrocardiogram on admission (fig. 1 A) shows auricular fibrillation, digitalis effect. After quinidine sulfate, grains 60, administered within thirty hours the regular sinus rhythm was established (fig. 1 B). Digitalis was discontinued and a maintenance dose of quinidine grains 6 daily was given. There have been no signs of decompensation for the last twelve months and a regular sinus rhythm has persisted during that time.

Case 2. A female, aged 60, with mild hypertension and known fibrillation for five years had had repeated episodes of cardiac failure only partially controlled with digitalis. There had been no response to full digitalization during the last hospitalization. There

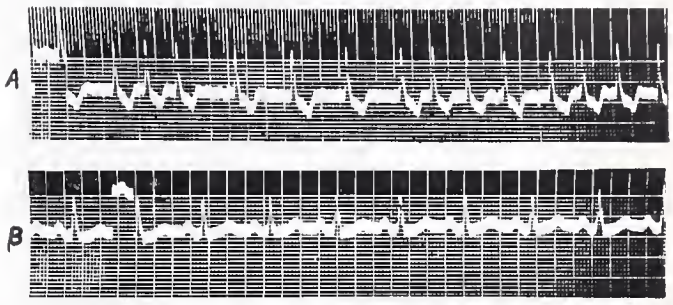


Fig. 3. Female, aged 63, hypertension, hyperthyroidism. A. Auricular fibrillation, full digitalization, persistent signs of cardiac failure. B. Regular sinus rhythm after the administration of 60 grains of quinidine sulfate in twenty-four hours; asymptomatic when last seen in clinic.

was progressive ankle edema, dyspnea and orthopnea. Electrocardiogram (fig. 2 A) shows auricular fibrillation with rapid ventricular response in spite of full digitalization. After the administration of 45 grains of quinidine sulfate within the next twenty-four hours a regular sinus rhythm was established (fig. 2 B). Digitalis was discontinued. Edema, dyspnea and orthopnea disappeared. The patient was kept on a maintenance dose of 6 grains of quinidine sulfate daily. There have been no recurrence of auricular fibrillation and no signs of heart failure for the last eighteen months.

Case 3. Female, aged 63, had had hypertensive cardiovascular disease, hyperthyroidism and irregular heart action for at least eight years. She had been in and out of the hospital for congestive heart failure since 1945 and had been on digitalis for four years. Last admission to the clinic was in February 1948 when there was marked cardiac decompensation and auricular fibrillation (fig. 3 A). She was given 45

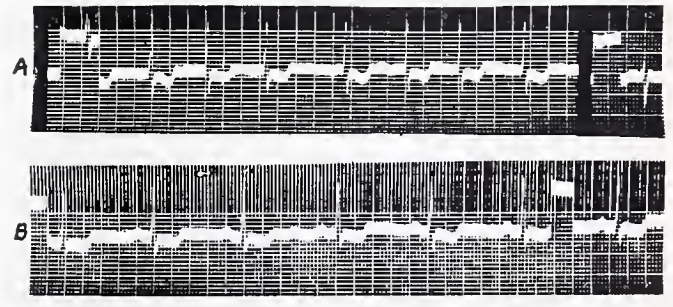


Fig. 4. Male, aged 68 years, coronary sclerosis. A. Auricular fibrillation; fully digitalized; persistent dyspnea, orthopnea and dependent edema. B. Regular sinus rhythm after 36 grains of quinidine sulfate, digitalis discontinued, no signs of decompensation, feeling fine.

grains of quinidine sulfate in the next twenty-four hours in five divided doses. Next day a regular sinus rhythm was established (fig. 3 B). Digitalis was discontinued. The patient is on a maintenance dose of quinidine sulfate, grains 9 daily. She was asymptomatic and had a regular sinus rhythm when last seen in the clinic in December 1950.

Case 4. Male, 68 years old, had a history of coronary occlusion five years previously. Enlarged liver, dependent edema, left ventricular hypertrophy, cardiac

failure and auricular fibrillation were present (fig. 4 A). He showed moderate improvement on digitalization and diuretics. Thirty-six grains of quinidine sulfate administered during the next twenty-four hours produced a regular sinus rhythm (fig. 4 B). Digitalis was discontinued. When last seen he had no respiratory distress, no signs of decompensation and was feeling fine.

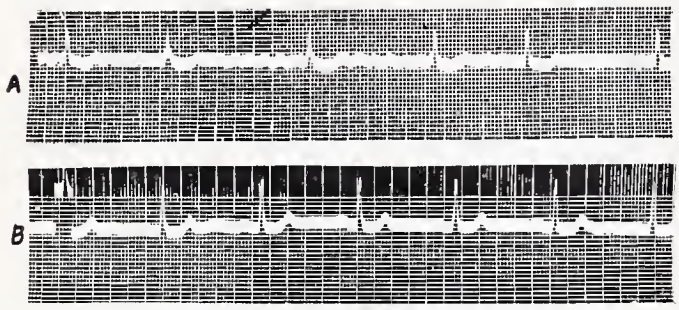


Fig. 5. Male, aged 79 years, coal miner for twenty-five years, cardiac decompensation, generalized emphysema. A. Auricular fibrillation, digitalis effect, symptoms of decompensation only partially relieved. B. Regular sinus mechanism after 45 grains of quinidine sulfate, asymptomatic.

Case 5. Male, 79 years old, coal miner for twenty years, had severe dyspnea and rales at both bases. Liver was palpable, marked ascites, dyspnea and 3 plus dependent edema. Emphysema and auricular fibrillation were present (fig. 5 A). He showed only moderate improvement under digitalis, ammonium chloride and mercurial diuretics. He was given 45 grains of quinidine sulfate and regular sinus rhythm was established (fig. 5 B). When last seen in the clinic six months later he was asymptomatic and had regular sinus rhythm. He was maintained on quinidine sulfate, grains 3, three times a day.

Case 6. Female, 70 years old, had shortness of breath, swelling of both ankles, pneumonia in the right lower lobe, palpable liver and blood pressure was 105/70. First record of auricular fibrillation was five years previously (fig. 6 A). She has been taking digitalis since that time. She had been hospitalized in the last five years for cardiac decompensation. Received quinidine sulfate grains 9 every four hours for six doses at which time regular sinus rhythm was established (fig 6 B). She was seen regularly in the outpatient clinic and showed no shortness of breath, minimal dependent edema, regular sinus rhythm. No digitalis medication was given.

COMMENT

The only definite contraindications to the use of quinidine are severe conduction defects, bacterial endocarditis and perhaps angina pectoris if relieved by the fibrillation. It is our belief that all other patients with chronic auricular fibrillation should be given a trial on quinidine. Embolic phenomena are more common in patients with auricular fibrillation than in those whose rhythm is restored to normal by quinidine. Close observation and frequent electrocardiographic studies, preferably in the hospital, are advisable at the beginning of the treatment.

SUMMARY AND CONCLUSIONS

Six cases with chronic auricular fibrillation and in cardiac failure were treated with quinidine and restored to normal rhythm. Definite subjective improvement and signs of cardiac efficiency were accompanied by return to normal sinus rhythm.

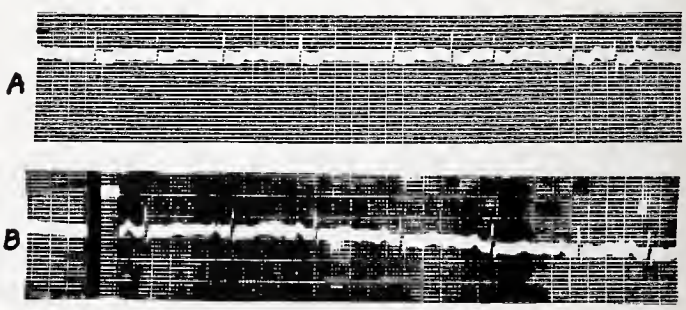
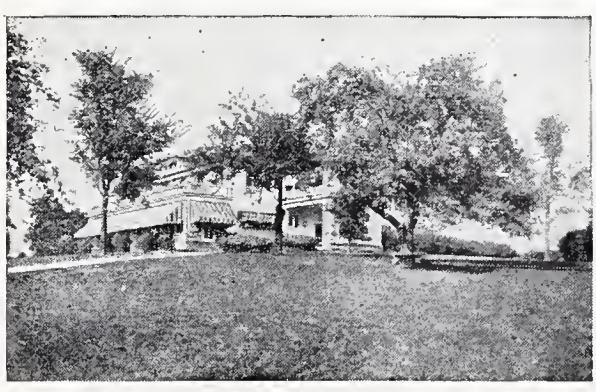


Fig. 6. Female, aged 70 years, blood pressure 105/70, pneumonia, decompensated. A. Auricular fibrillation, full digitalis effect, repeated hospital admissions for cardiac failure. B. Regular sinus rhythm after 36 grains of quinidine sulfate, digitalis discontinued, symptom free.

Most patients require a maintenance dose of quinidine to prevent return of auricular fibrillation.

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PRESIDENT'S PAGE

The bringing together, with mutual satisfaction, of physicians seeking locations for practice and communities seeking physicians is becoming an important function and service of state medical associations. However, it was forcefully pointed out at a Physician Placement meeting, called by the Council on Medical Service of the American Medical Association in Chicago on October 12, that this service can well be implemented in numerous states and improved in others.



It is a pleasure to report that through the headquarters office of the Missouri State Medical Association, an effective physician placement service is being maintained. My feeling in this respect was strengthened further from the opportunity which was mine to be part of, as well as participate in, this meeting of October 12.

The Association office is prepared now, as it has been in the past, to furnish full information to physicians seeking locations in Missouri and to assist communities to secure physicians for their localities.



Editorials

THE DOCTOR AND THE VOLUNTARY HEALTH PLAN

The voluntary hospital and medical insurance plans are of great importance to the people of the community but they are equally important to the physicians of that community since they enable him to give good medical care without too great a strain on the finances of the patient.

The physician, then, has a responsibility to see that the plans are not needlessly used and that extravagance and waste are avoided—since the physician is the sole arbitrer of which patients shall enter the hospital and what therapy and laboratory procedures are needed. He may find it necessary to educate the patient against seeking hospitalization when hospitalization is unnecessary. This may be a difficult task since it has become common practice for everyone in the family to work and it is often difficult for the patient to receive care at home even if the disability is relatively minor. The doctor may help the family in this dilemma by instructing them in nursing methods such as making fluids freely available at the bedside. Even food can be prepared ahead of time and by use of special packaging with wax paper, aluminum foil, and freezing can be kept fresh and appetizing. Disposable dishes, paper cups and other modern developments make it much easier for the patient to care for himself or for a member of the family to care for a sick person with a minimum of time and effort.

The extensive laboratory studies which frequently are ordered by the physician, or unhappily through the doctor by the patient, are all too often expensive luxuries, the purpose of which are not apparent. Simple, basic laboratory studies, if that is all that is needed, should be done outside the hospital so that the financial load on the patient and the plan is kept as low as possible. Frequently the physician and the patient fail to realize that the income lost by a few days in the hospital may exceed the financial benefits gained by hospitalization.

Another great financial drain on voluntary hospital plans is the patient who wants to stay on just one or two days after the doctor thinks they can safely leave the hospital.

Physicians must be realistic, honest and fair—they must avoid the pitfalls given in a recent letter by the President of the Missouri Medical Service. They must have the courage to play fair with everyone, including patients, voluntary health plans and themselves. They must also stand against unnecessary expenses which hospitals sometimes make and which serve no useful purpose so far as the welfare of the patient is concerned.

There is, of course, a luxury type of medical care in which the patient is given the services and privileges of the fanciest hotels. Such services are expensive and raise the per diem cost to exorbitant levels. Each physician should be certain that he does not encourage this type of inflation in hospital costs by demanding such luxurious care for his patient.

Help keep hospital costs down through sound judgment and integrity.

CASE FINDINGS IN DIABETES

Physicians have long known from the histories diabetic patients give that in many instances the symptoms have not been severe enough to make life uncomfortable to the extent that the individual sought the aid of his physician. The probabilities were that diabetes existed months and years before discovery. This was true particularly in the older person because the disease in the young is more acute and does not exist in most instances but a few weeks before polyuria, thirst and acidosis appear.

Because of these well known facts the Diabetes Division of the Public Health Service under the guidance of Wilkerson[1] decided to canvas a small town to see to what extent undiagnosed diabetes existed. Wilkerson was able to get blood samples (venous in most instances) and urine from 3,500 individuals out of a population of approximately 5,000 people. From the 3,500 individuals he believed he found thirty individuals who were diabetic but unaware of the disease.

The critically minded diabetic expert could well challenge Wilkerson's conclusions from the study of the data presented. Six of the cases probably were not diabetic, judged from the data given; three more were doubtful. Actually only twenty-one presented data that could unequivocally prove the diagnosis of diabetes.

So much emphasis has been laid on these figures of Wilkerson that it is thought worth while to point out that the incidence of unknown diabetes may not be as high as has been suggested. If Marks[2] figure of 700,000 known diabetic persons be accepted (0.5 per cent of population) and estimation of the unknown cases is based on twenty-one per 3,500 people (0.6 per cent), there are at least a million and a half diabetic persons in the country and 41,000 in Missouri. Half of these are unknown. From 70 to 80 per cent are 50 or more years of age.

The outstanding fact about diabetes is that it is a disease that responds well to treatment, so much so that 80 per cent of diabetic persons can work and earn a living. Certainly the medical profession should enthusiastically enter into the effort sponsored by the American Diabetes Association to discover the unknown diabetic person. Diabetes Week is November 11 to November 17.

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Organization and Economics

NEWS

Alfred Goldman, M.D., St. Louis, will speak at the eighth annual meeting of the Southern Chapter of the American College of Chest Physicians in Dallas, Texas, on November 4. His subject will be "Streptokinase-Streptodornase (SK-SK) in Inflammatory Diseases of the Chest."

J. W. Thompson, M.D., St. Louis, was elected vice president of the Southwestern Surgical Congress which met in St. Louis in September.

Grayson L. Carroll, M.D., St. Louis, received the 1951 Distinguished Service Award of the Mississippi Valley Medical Society at a meeting of the society in Peoria on September 20.

The Boone County Medical Society at a recent meeting went on record as "regretting that force of circumstance made Dr. Trawick Stubbs feel that it was necessary for him to resign as Dean of the University of Missouri Medical School and regret the loss to the community of the services given by this energetic, loyal and honorable physician."

Paul Murphy, M.D., St. Louis, was recently appointed a member of the State Board of Nurses' Examiners.

MUSINGS BY THE FIELD SECRETARY

The week of September 16 brought the 1951 annual meeting of the American Hospital Association to St. Louis. The perennial problem concerning the relationship between hospitals and physicians, particularly those specialties including anesthesiology, pathology and radiology, was again aired in one of the general sessions by means of a symposium. John W. Kline, M.D., San Francisco, President of the American Medical Association, appeared as a participant on this symposium.

October 1 through October 4 witnessed another top notch clinical conference of the Kansas City Southwest Clinical Society. The excellent attendance at the various sessions stand as proof for the high quality of the scientific programs.

Various and sundry schemes were proposed for "Adding life to years, not just years to life" at the Second International Gerontological Congress which met in St. Louis during the week of September 9. Representatives from fifty-two counties were numbered among the some 750 registrants. Problems affecting older people were explored in sections devoted to Biology and Medicine; Sociology, Psychology, Education and Religion; Economics, Employment and Welfare; Medical Services, Hygiene and Housing.

The new Pemiscot County Memorial Hospital was dedicated with appropriate ceremony on Sunday afternoon, August 26. It was open to receive patients on the succeeding day. The hospital is located at Hayti and fills a big need for hospitalization in that area. The building is three floors with a sixty-two bed capacity. The structure, equipment, grounds and incidentals represent an outlay of approximately a half million dollars. The funds for construction were derived from three sources—a county bond issue of $350,000, $10,000 from the State of Missouri and approximately one third from the federal government under the Hill-Burton Hospital Construction law.

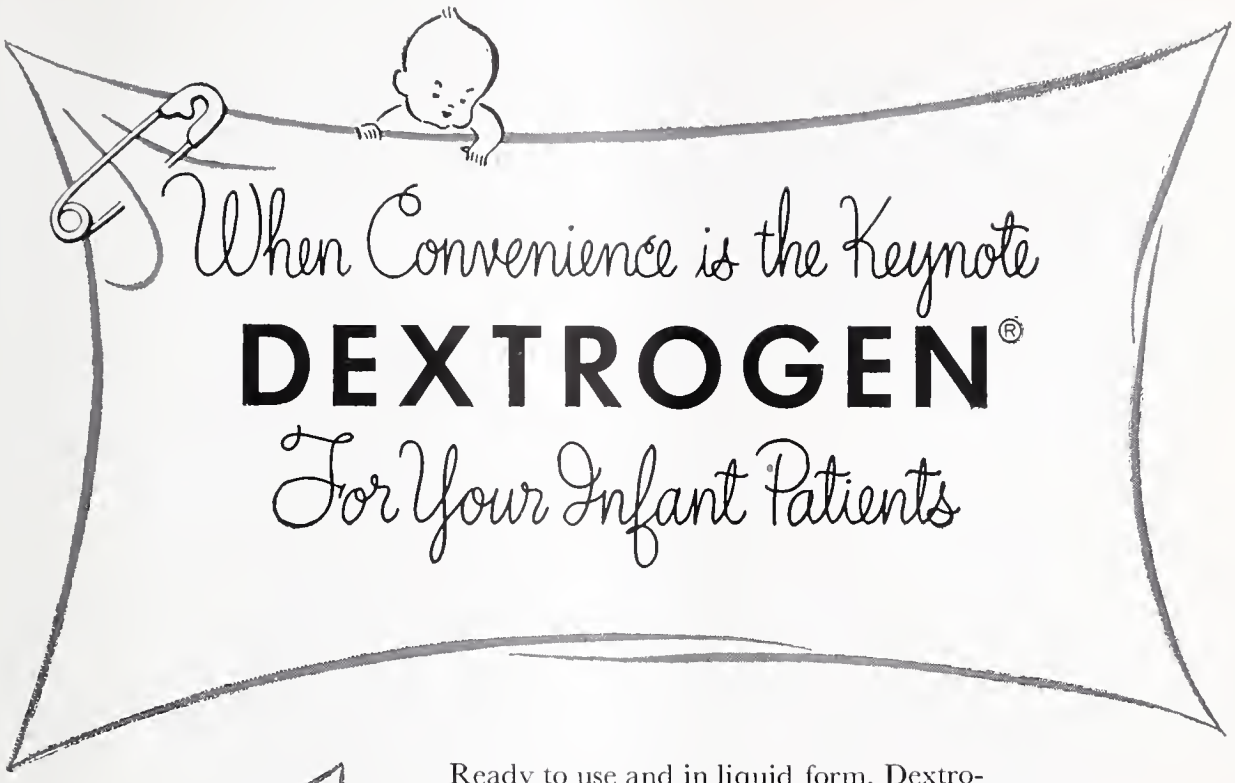
The Bonne Terre Hospital at Bonne Terre has recently completed a $680,000 two and one half years' building and remodeling program. The present capacity of the hospital, including the new wing, is seventy-seven adult beds. This fine hospital is owned and operated by the Bonne Terre Hospital Association, a nonprofit organization. Fortunately, the annual deficit is subsidized by the St. Joseph Lead Company. No tax funds have been used in the building, remodeling or operation of this institution—only private funds. The active medical staff is comprised of those physicians who are members of the Mineral Area and Jefferson County medical societies.

The annual Clay County Clinical Conference takes place in Excelsior Springs at the Elms Hotel on Thursday, November 1. It begins with a noon luncheon with the scientific program continuing through the afternoon and evening. Both in and out of state speakers are on the program. This conference is a specific contribution of the Clay County Medical Society to the promotion of high quality postgraduate opportunities for physicians in Missouri, especially those in the western part of the state.

The semiannual meeting of the St. Joseph Clinical Society will be held in St. Joseph on Thursday, November 8. Three sessions will be held—a luncheon, afternoon and evening. The subjects and speakers have been chosen carefully to assure a practical and interesting program.

NEW MEMBERS

Everett, Ernest F., Jr., M.D., Jefferson City.
Fisher, George E., M.D., Lebanon.
Guhleman, Henry V., M.D., Jefferson City.
Holton, Edward B., M.D., Independence.
Matthews, John I., M.D., Jefferson City.
Waxman, David, M.D., Kansas City.
Waxman, Jane Zabel, M.D., Kansas City.



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The higher protein eontent of normally diluted Dextrogen—2.2% instead of 1.5% as found in mother's milk—satisfies every known protein need of the rapidly growing infant. Its lower fat content makes for better tolerability and improved digestibility.

Dextrogen serves well whenever artificial feeding is indieated, and is particularly valuable when convenienee in formula preparation is desirable.

*Applicable third week and thereafter; 1:3 for first week, 1:2 for second week.

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NOTE HOW SIMPLE TO PREPARE

All the mother need do is pour the contents of the Dextrogen can into a properly cleaned quart milk bottle, and fill with previously boiled water. Makes 32 oz. of formula, ready to feed.*

DEATHS

Rigdon, Thomas J., M.D., Kennett, a graduate of the Kentucky School of Medicine, Louisville, 1900; honor member of the Dunklin County Medical Society; aged 84; died August 25.

Dexheimer, Frank E., M.D., Columbia, a graduate of the University of Pennsylvania School of Medicine, 1924; Fellow of the American Medical Association; member of the Boone County Medical Society; aged 50; died August 30.

Hetherington, Ellery M., M.D., Kansas City, a graduate of the College of Physicians and Surgeons of Baltimore, 1888; honor member of the Jackson County Medical Society; retired; aged 91; died September 8.

MISSOURI HEALTH COUNCIL

Some seventy-five persons attended the Conference on Medical, Hospital and Dental Care of Missouri's Indigent Sick at Jefferson City on September 26, sponsored by the Missouri Health Council. C. Edgar Virden, M.D., Kansas City, President of the Association, and A. E. Spelman, Smithville, Chairman of the Association's Committee on Rural Medical Service, represented the Missouri State Medical Association at this session.

The morning session consisted of twenty minute talks by representatives of five organizations which have particular cause to be fully aware of the problem. Buford G. Hamilton, M.D., Jefferson City, spoke for the Missouri Division of Health; Mr. H. J. Mohler, St. Louis, Chairman, Legislative Committee, Missouri Hospital Association, spoke for the Hospital Association; Mr. Hubert Harris, Jefferson City, spoke for the Missouri Division of Welfare; Dr. Ralph Rosen, St. Louis, spoke for the Missouri State Dental Association; A. E. Spelman, M.D., Smithville, spoke for the Missouri State Medical Association.

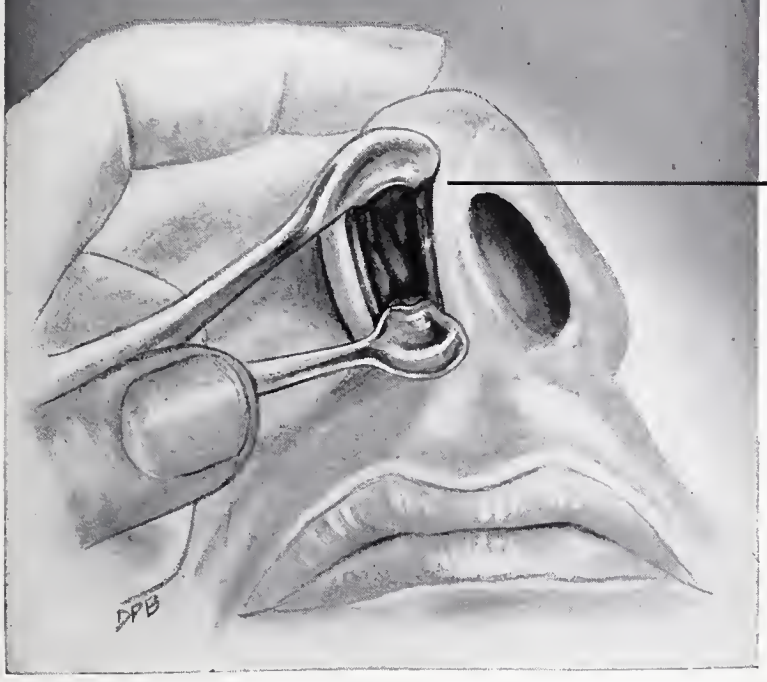
For the afternoon session the speakers of the morning served as a panel which was moderated by L. E. Ziegler, Canton, President of Culver-Stockton College. Questions from the floor were discussed by the panel members and by many of those in the audience. The informal discussions brought out the many problems concerned with the subject of the conference, some of which are: financing the hospitalization of the indigent sick, responsibilities as to delivering and financing medical and dental care, rehabilitation and ways and means of initiating and consummating local methods, as far as possible, of solving the problems.

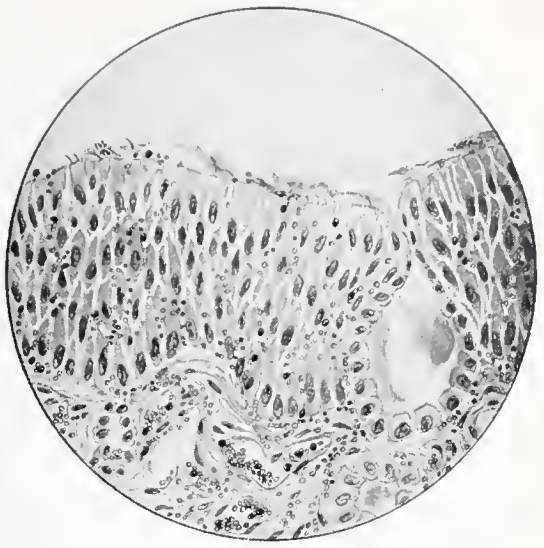
The group agreed that the local county health council represents a vehicle which may be effectively used to develop community support for proper programs designed to solve the problems under discussion. In addition, the Missouri Health Council was requested by motion to appoint a special committee to explore further this overall problem of the care of the indigent sick and to sponsor another meeting of this type early in 1952.



The new wing of the Bonne Terre Hospital, Bonne Terre, recently completed, gives a capacity of seventy-seven beds. The hospital is owned and operated by the Bonne Terre Hospital Association, a nonprofit organization. Private funds paid for the addition and other remodeling of the hospital and the St. Joseph Lead Company subsidizes any annual deficits of the hospital.

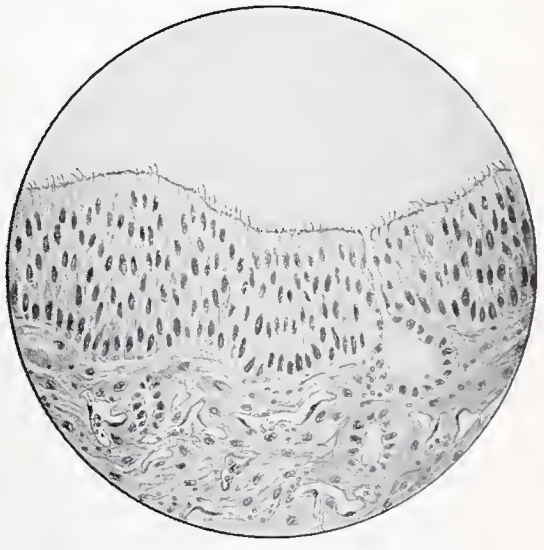
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in colds
. . . sinusitis





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Normal appearing nasal epithelium.



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MEDICAL STUDENTS TO PUBLISH MAGAZINE

The first issue of the *Journal of the Student American Medical Association*, a seventy-two page publication, will be published in January, Russell F. Staudacher, executive editor, has announced. The journal will be published nine months of the year, skipping July, August and September when schools are closed. The magazine will have a circulation of approximately 33,000, composed of 26,191 medical students and about 7,000 interns.

The journal will be the publication of the Student American Medical Association, organized in Chicago in December 1950. The objectives of the organization are: (1) advancement of the profession of medicine, (2) contribution to the welfare and education of medical students, (3) familiarization of its members with the purposes and ideals of the medical profession, and (4) preparation of its members to meet the social, moral and ethical obligations of the profession of medicine.

SYMPOSIUM ON CANCER OF THE STOMACH

A symposium on "Cancer of the Stomach" will be held Saturday, December 1, at the Ellis Fischel State Cancer Hospital, Columbia, sponsored by the Missouri Society of Pathologists and the Missouri Division of the American Cancer Society.

Guest speakers will be Edward B. Benedict, M.D., Boston, endoscopist; Gordon P. McNeer, M.D., New York, surgeon; Malcolm B. Dockerty, M.D., Rochester, Minnesota, pathologist; Leo G. Rigler, Minneapolis, radiologist.

The meeting will begin at 10:00 a. m. and will consist of presentations of recent advances in diagnosis and therapy of gastric cancer, to be followed by invited and general discussion. The meeting is open to all interested physicians.

GASTROINTESTINAL DISORDERS

A two day course presenting a postgraduate review of recent advances in gastro-enterology intended for the physician in general practice and the internist as well as the gastro-enterologist, will be presented on December 6 and 7 by Washington University School of Medicine and affiliated hospitals, St. Louis. A tuition fee of $30.00 will be charged for the course.

The following subjects and lecturers will comprise the course: "Roentgenologic Diagnosis in Gastrointestinal Disease," Gladden V. Elliott, M.D.; "Gastroscopy in Diagnosis of Gastric Disease," John L. Horner, M.D.; "Achalasia and Cardiospasm: Clinical and Experimental Considerations," Albert I. Mendeloff, M.D.; "Surgical Treatment of Achalasia," Thomas H. Burford, M.D.; "Acute and Chronic Pancreatitis," Robert Elman, M.D.; "Complications of Peptic Ulcer," Charles W. Duden, M.D.; "Ectopic Peptic Ulcer," Warren Lonergan, M.D.; "Surgical Aspects of Peptic Ulcer," Ben Eiseman, M.D.; "Psychosomatic Aspects of Gastrointestinal Disease," George Saslow, M.D.; "The Interpretation of Liver Function Tests," Albert I. Mendeloff, M.D.; "Needle Biopsy of the Liver," Michael Karl, M.D.; "Treatment of Hepatitis and Cirrhosis," Robert Shank, M.D.; "Control of Esophageal Hemorrhage," Bruce Kenamore, M.D.; "Surgical Treatment of Portal Hypertension," Charles Eckert, M.D.; "ACTH and Cortisone in Gastrointestinal Diseases," William Daughaday, M.D.; "Ulcerative Colitis," Harold Scheff, M.D.; "Surgical Treatment of Ulcerative Colitis," Eugene Bricker, M.D.; "Amoebiasis," Gastave J. Dammin, M.D.

THE COUNCIL

The Council met at Hotel Robidoux, St. Joseph, on September 22 and 23, with Victor B. Buhler, M.D., Kansas City, Chairman, presiding. Those present were Drs. Donald M. Dowell, Chillicothe; W. F. Francka, Hannibal; Armand D. Fries, St. Louis; J. F. Jolley, Mexico; R. W. Kennedy, Marshall; Victor B. Buhler, Kansas City; W. S. Sewell, Springfield; E. C. Bohrer, West Plains; Frank W. Hall, Cape Girardeau; C. Edgar Virden, Kansas City; J. W. Thompson, St. Louis; H. E. Petersen, St. Joseph; Carroll P. Hungate, Kansas City; A. E. Spelman, Smithville; Senator John Noble, Kennett; Messrs. Lemoine Skinner, St. Louis; D. E. Caywood, Springfield; W. H. Bartleson, Kansas City; E. M. Hirsch, St. Joseph; Raymond McIntyre, St. Louis; T. R. O'Brien, St. Louis.

Student American Medical Association

Mr. O'Brien read a letter and gave information on the Student American Medical Association stating that there were forty chapters in the seventy-nine medical schools and that there was no chapter in Missouri. After discussion by Drs. Francka, Thompson, Kennedy and Petersen, on motion of Dr. Dowell it was voted that the Council go on record of approving chapters in Missouri and giving all assistance possible.

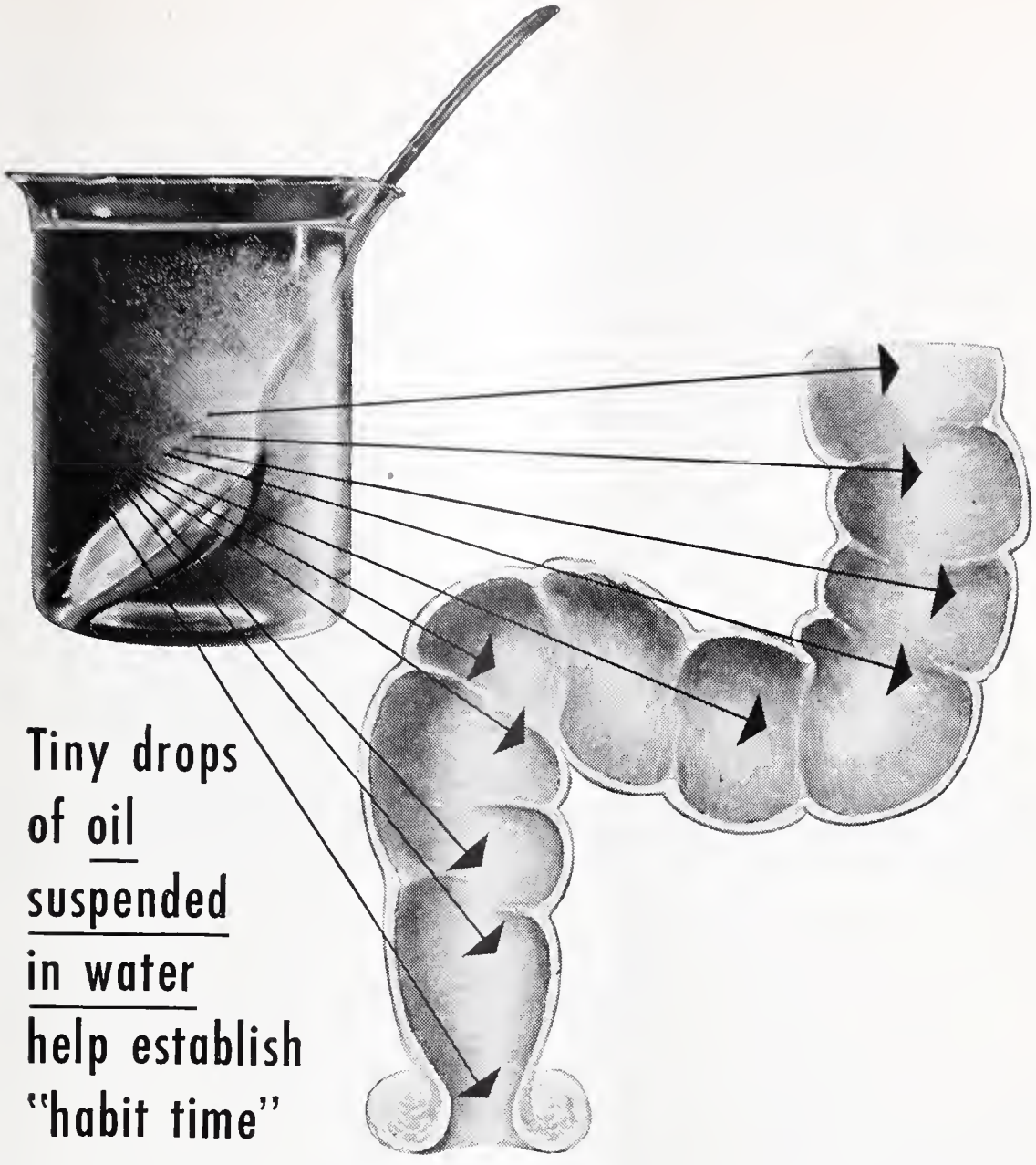
NATIONAL FOUNDATION FOR INFANTILE PARALYSIS

Mr. O'Brien read a communication from the American Medical Association stating that upon the request of the Foundation, the Board of Trustees had agreed to the following proposals of the National Foundation:

"That in those counties where acceptable treatment facilities are already available or may be developed in the future, the county medical society recommend to the Chapter of the National Foundation for Infantile Paralysis a panel of physicians equal to double the number of committee members to be appointed, who would be willing to serve as medical advisors to the Chapter in its medical care program. The Chapter would then name a Medical Advisory Committee from this panel which would serve the Chapter and represent the medical profession.

"It is the function of the Medical Advisory Committee to:

"1. Establish within the treatment center procedures which will be uniformly acceptable to the attending



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staff for the admission, treatment and discharge of polio patients.

"2. Recommend to the Chapter standards of service for which monies may be spent by the Chapter in the event the poliomyelitis patient or his parents require financial assistance from the Chapter for the payment of services.

"3. Recommend to the Chapter equipment which is needed by the treatment center for the care of polio patients.

"4. Establish a schedule for the payment of medical fees if the physicians in the community are accepting payment from a voluntary public agency for professional services.

"5. Serve as a 'grievance committee' where there are disagreements between the Chapter and an individual physician regarding professional disputes over fees or other practices which may not conform to the established procedures for treatment as referred to above."

After discussion by Drs. Buhler, Francka, Sewell, Kennedy, Petersen, Dowell, Jolley and Mr. McIntyre, on motion of Dr. Kennedy it was voted to approve in principle these recommendations and to refer it to the Committee on Poliomyelitis for activation with offer of assistance from the Association office.

It was mentioned that it had been suggested that a special "Polio Policy" was being considered by Missouri Medical Service. The Council felt that this should be explored.

TREASURER'S REPORT

Mr. O'Brien presented the report of the Treasurer, in his absence, giving the financial status of the Association and showing that the payment of the assessment was progressing and that it was expected that, on present figures, 95 per cent of the assessment would be forthcoming.

Report of Field Secretary

Mr. McIntyre reported on activities since the last Council meeting, including a report on the exhibit at the State Fair, in which the Association was assisted by the American Medical Association in lending an exhibit and furnishing two men to assist with it. He told of the Missouri Health Council meeting in Jefferson City on September 26. Mr. McIntyre and Dr. Virden reported an A. M. A. conference on Physician Placement to be held in Chicago on October 12 and 13. Present situation on new hospitals was given and Mr. McIntyre stated that since the first of the year 50 physicians had gone into practice in rural Missouri. After discussion, on motion of Dr. Jolley, it was voted to thank the A. M. A. for its assistance in the exhibit at the Fair and to encourage the A. M. A. to do more of this type of thing. Dates of various postgraduate meetings throughout the state to be held during the fall were given. After discussion in which it was brought out that physician placement should be at a state level but that all state associations did not do this work actively, upon motion of Dr. Sewell it was voted that two members should attend the Conference on Physician Placement of the A. M. A.

Lafayette-Ray County Hyphenation

Upon request of Dr. Kennedy and on motion of Dr. Dowell, approval was given for Lafayette and Ray county medical societies to hyphenate.

Grand River Medical Society

Mr. McIntyre reported that at a meeting on September 20 the Grand River Medical Society was formed, composed of Caldwell, Livingston, Grundy, Daviess, Mercer, Harrison and Linn counties. The Council had formerly approved the hyphenation.

Intrastate Membership

Mr. Bartleson presented the problem in Jackson County in relation to members of the Missouri State Medical Association, who had their practice and lived in Missouri but who were on the staff of the University of Kansas and who were transferring to the Kansas State Medical Association through the Johnson or Wyandotte County Medical Societies of Kansas. After discussion in which it was brought out that Kansas State Medical membership was not required by the University of Kansas and that there was considerable difference in dues of the various county societies, on motion of Dr. Petersen, it was voted that the Council ask the executive body of the Kansas Association to approve negotiation by the counties involved.

Audrain County Hospital Suit

Senator Noble stated that the briefs in the suit would be placed before the Supreme Court on September 26 and that depending on the amount of work of the Supreme Court, a decision might be expected in approximately two months.

Legislation

Mr. O'Brien reported briefly on state and national legislation, calling attention to information that had been sent direct to members and carried in THE JOURNAL. He said that in the present session of the State Legislature, redistricting of the state would be time consuming and that probably not much else would be taken up.

Ives Amendment

Mr. O'Brien reported that the Ives Amendment which would have allowed deductions for professional people on certain investments, is not likely to be considered by this Congress.

Four Year Medical School

The situation on the four year medical school was discussed by most of those present and upon motion of Dr. Thompson, it was voted that it be the policy of the Missouri State Medical Association to reaffirm its position in favor of the Board of Curators establishing a four year school in a metropolitan area, but that the Association recognizes the authority of the Board of Curators to establish schools within the University and conduct such schools and that the Missouri State Medical Association does not oppose any action the Board may take in this matter and will restrict the Association's activity to stating, upon appropriate occasion, the views it holds. Dr. Virden said that he had been invited to furnish information to the Missouri Alumni publication and it was suggested that the material which he presented before the legislative committee meeting at Jefferson City be submitted.

State Laboratories

A letter from Dr. Buford G. Hamilton, State Health Commissioner, was read asking the approval of the

Council in his refusing laboratory work to unqualified practitioners. Upon motion of Dr. Jolley it was voted that the Council unqualifiedly approve the refusal to accept material in state laboratories submitted by other than those legally permitted to make such use of the laboratories.

1952 Annual Session

Mr. O'Brien reported that it had only within the last few days been definitely determined that Smith, Kline and French could not furnish color television for the 1952 Annual Session and that a program was being arranged by the Committee which would include addresses, panels and conferences. He read letters concerning the reaction of exhibitors concerning the 1951 Annual Session and it was suggested that the names of the few exhibitors who were not satisfied be obtained if possible and that attempts be made to improve the things to which they objected.

A. M. A. Dues

Lists of members who are delinquent in A. M. A. dues were given each Councilor. It was stated that there might be cases in which exemption was appropriate and the Councilors were asked to report such cases.

Rural Health

Dr. Spelman reported the activities of the Committee on Rural Health and asked the approval of the Council of the Committee being active in promoting the establishment of Health Councils and County Health Centers. He reported the discussions of the Committee on the need for good practitioners, not specialists, in rural practice; the situation on use and obtaining Blue Cross coverage; the four year medical school in Missouri. After considerable discussion, it was felt that the problem of the Health Center needed further study and that further information would be forthcoming at the meeting of the Missouri Health Council on September 26, therefore on motion of Dr. Thompson, it was voted to table action on Health Centers for further study. The vote was five to four. It was pointed out that the Council had previously approved Health Councils. Dr. Virden suggested that men who had left rural practice be contacted and the reasons for their leaving determined and this information given to schools or to sources where difficulties would be overcome. On motion of Dr. Fries, the Committee was commended on its work.

Film on Reducing

A film prepared by the Metropolitan Life Insurance Company, "Cheers for Chubby," on which it had asked approval of the Council was shown. On motion of Dr. Hall, the film was approved. The A. M. A. and the U. S. Public Health Service had assisted in development of the film for showing in motion picture houses.

Civil Defense

Dr. Hungate reported that the situation on Civil Defense was in a state of flux and that changes might be expected. He said that the October issue of The Journal would be devoted to Civil Defense. He said that it would be a good thing if schools would set up one or two day courses, to be given at intervals, on treatment of atomic casualties, and that allied groups as nurses should be included. The recent flood disaster in Kansas and Missouri with the handling of it was discussed. The present law which restricts Civil Defense work to disasters caused by enemy attack was discussed but it was felt that nothing should be done at the present time in trying to change the law. On motion by Dr. Bohrer, it was voted to approve the suggestion to medical schools that they incorporate programs on treatment of atomic casualties. On motion of Dr. Sewell, the Council voted to accept the report and commend the work of the Committee.

White House Conference

Dr. Petersen presented a request from the Missouri Association for Social Welfare for the Association to join the advisory council which will represent lay and professional organizations formed to formulate and carry out the recommendations of the recent White House Conference. Mr. McIntyre reviewed the appointment by the Governor of a committee for study of the White House Conference and later the dismissal of the committee after the Conference. He reported that 135 organizations were represented at a meeting held on May 26 called by the Missouri Association for Social Welfare in this connection. After discussion, on motion of Dr. Fries, it was voted to table the matter and refer to the Committee on Infant Care for further information and advice.

Milk Inspection Law

Dr. Virden presented the request of Dr. Hamilton that the Council approve bringing all milk inspection in the state to conform with the U. S. Public Health Service standards. Discussion brought out that because of well established work in some parts of the state, the problem became complicated and it needed close study. On motion of Dr. Petersen, it was voted to refer the matter to the proper Committee for consideration and that Dr. Hamilton be informed by letter of the action of the Council.

Government Bonds

Upon information given by Dr. Virden, it was voted that letters be sent by the Treasury Department to members concerning the purchasing of government bonds.

Budget Committee

The Chairman appointed the following Budget Committee: Drs. Virden, Thompson, Hyndman, Petersen and Sewell.

Place of Meeting

It was decided that the November meeting of the Council would be held in St. Louis.

Council Guests

It was suggested that Councilors bring guests from their district to Council meetings for the purpose of members becoming more conversant with the work of the Council. It was decided that Councilors of odd numbered districts bring a guest to the next Council meeting and that Councilors of even numbered districts invite a guest for the next meeting.

Executive Session

The Council held a short executive session.

CONTROL of the CORROSION FACTOR in PEPTIC ULCER

A Report on the Efficacy of Dihydroxy Aluminum Aminoacetate

(ALGLYN® N.N.R.)

As a Gastric Antacid

Alglyn®, dihydroxy aluminum aminoacetate, is the product of combining *aluminum* with the amino acid, *glycine*. It was developed by Krantz, of the University of Maryland, in co-operation with the research staff of the Brayten Pharmaceutical Company. The objective was to produce a nonsystemic gastric antacid *in tablet form* that would be consistently prompt and persistent in its action.

Alglyn tablets were found to possess a uniform reaction rate, regardless of their shelf age. Laboratory evaluations have repeatedly shown that the reaction rate of Alglyn tablets compares favorably with that of liquid preparations of aluminum hydroxide.[1,2,3] The onset of action is somewhat more rapid for Alglyn than for dried aluminum hydroxide tablets. The difference in reaction rate is measurable by laboratory methods and is sometimes clinically detectable as well, as evidenced by the fact that patients frequently report that they get more consistently prompt relief from Alglyn tablets than from many other aluminum-antacid tablets. In ten minutes the pH is raised to approximately 3.9 and remains above 3.0 for two hours. Even when given in excess, however, Alglyn tablets cannot produce a pH higher than 4.5; neither cause alkalosis nor stimulate rebound secretion of acid.

Clinical experience shows that Alglyn tablets are eminently efficient as gastric antacids, can be used effectively and safely for correcting hyperacidity whenever that is responsible for distress.[4,5] They are especially valuable in the treatment of patients who have peptic ulcer, and those predisposed to recurrent ulcer — whenever both rapid and sustained control of gastric acidity is advisable, either for treatment or prophylaxis.

In addition to their antacid effect, Alglyn tablets have coating and demulcent properties which are believed to play an important part in protecting and soothing the gastric mucosa. Their effectiveness may be further explained by their tendency to increase mucin secretion and their ability to precipitate pepsin *in vitro*.

Altogether, these effects help to create and maintain a gastrointestinal environment that is conducive to uninterrupted ulcer healing.

Although Alglyn tablets have a high acid-buffering capacity, their aluminum content is relatively low (40% less than dried aluminum hydroxide). Alglyn tablets are small, easy to take; have a pleasant mint flavor; do not feel gritty in the mouth.

Dosage: 1 or 2 tablets an hour or two after meals and at bedtime, or as otherwise required to control hyperacidity.

Alglyn tablets are supplied in bottles of 50 and 100 tablets. Each tablet contains 0.5 Gm. (7.7 grains) of dihydroxy aluminum aminoacetate. Brayten Pharmaceutical Company, Chattanooga 9, Tennessee.

References

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3. Holbert, J. M.; Noble, N., and Grote, I. W.: A Study of Antacid Buffers. II. Prolonged Neutralization, J. Am. Pharm. A. (Scient. Ed.) 37: 292-294 (July) 1948.
4. Krantz, J. C., Jr.; Kibler, D. V., and Bell, F. K.: The Neutralization of Gastric Acidity with Basic Aluminum Aminoacetate, J. Pharmacol. & Exper. Therap. 82: 247-253 (Nov.) 1944.
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COUNTY SOCIETY HONOR ROLL—1951

(Societies which have paid dues for all members and date placed on Honor Roll)

Benton County Medical Society—November 28, 1950
Camden County Medical Society—November 29, 1950
Miller County Medical Society—December 8, 1950
Mercer County Medical Society—December 12, 1950
Moniteau County Medical Society—December 16, 1950
Lewis-Clark-Scotland Counties Medical Society—December 20, 1950
Webster County Medical Society—December 20, 1950
Carroll County Medical Society—December 26, 1950
Dallas-Hickory-Polk Counties Medical Society—December 28, 1950
Morgan County Medical Society—January 2, 1951
Holt County Medical Society—January 4, 1951
Pike County Medical Society—January 9, 1951
Harrison County Medical Society—January 10, 1951
Audrain County Medical Society—January 18, 1951
Montgomery County Medical Society—January 22, 1951
Pettis County Medical Society—January 23, 1951
Scott County Medical Society—January 24, 1951
Lincoln County Medical Society—January 25, 1951
Henry County Medical Society—January 27, 1951
Howard County Medical Society—February 3, 1951
Stoddard County Medical Society—February 6, 1951
Bates County Medical Society—February 7, 1951
Marion-Ralls Counties Medical Society—February 20, 1951
Caldwell-Livingston Counties Medical Society—March 5, 1951
Callaway County Medical Society—March 15, 1951
South Central Counties Medical Society—March 18, 1951
Cole County Medical Society—March 29, 1951
Laclede County Medical Society—March 30, 1951
Ray County Medical Society—April 7, 1951
Newton County Medical Society—April 9, 1951
DeKalb County Medical Society—April 14, 1951
Grundy-Daviess Counties Medical Society—April 23, 1951
Linn County Medical Society—September 1, 1951

SOCIETY PROCEEDINGS

FIRST COUNCILOR DISTRICT

DONALD M. DOWELL, CHILLICOTHE, COUNCILOR

On Thursday night, September 20, at Chillicothe, a new county medical society was born. The name of this newcomer is the Grand River Medical Society. The former county societies making up the hyphenation were Caldwell-Livingston, Grundy-Daviess, Harrison, Linn and Mercer. Thirty physicians were present to participate in the organizational activities.

C. Edgar Virden, M.D., Kansas City, President of the Association, addressed the group, placing special emphasis on the Association's position regarding the proposed four year medical school.

H. E. Petersen, M.D., St. Joseph, Secretary of the Association, spoke briefly on the values to be derived from hyphenations of small societies.

The scientific program of the evening was presented by Ralph Coffey, M.D., Kansas City, a member of the Committee on Scientific and Postgraduate Work of the Association. He discussed "A New Anatomic Approach in the Repair of Inguinal and Incisional Hernia."

Officers elected for the new Society are: President, William A. Fuson, M.D., Trenton; vice president, Virgil Vandiver, M.D., Chillicothe; secretary-treasurer, E. A. Duffy, M.D., Trenton.

The first meeting of the Grand River Medical Society has been set for Thursday night, December 6, at Chillicothe.

Donald M. Dowell, M.D., Councilor

FOURTH COUNCILOR DISTRICT

JOHN O'CONNELL, OVERLAND, COUNCILOR

Jefferson County Medical Society

A clinical heart conference comprised the program at the October 5 meeting of the Jefferson County Medical Society at Crystal City. Two members of the Society, J. F. Rutledge, M.D., and V. E. Schulein, M.D., Crystal City, presented case histories and work-ups on two heart patients for discussion.

J. G. Janney, Jr., M.D., and James P. Murphy, M.D., St. Louis, of the Cardiovascular Section of St. Louis University School of Medicine, participated as consultant discussants for the two cases.

Grants have been made to the Missouri Division of Health and in turn to St. Louis University School of Medicine for the promotion of postgraduate heart sessions of this and other types throughout the state. The program for this meeting was arranged by the Committee on Scientific and Postgraduate Work of the Association.

J. F. Rutledge, M.D., Secretary.

NINTH COUNCILOR DISTRICT

E. C. BOHRER, WEST PLAINS, COUNCILOR

South Central Counties Medical Society

The South Central Counties Medical Society met for dinner at the Elliott Hotel, Mountain Grove, September 19, with the following members and visitors present: Drs. R. A. Ryan, R. W. Denney, H. G. Frame and A. C. Ames, Mountain Grove; Garrett Hogg, Jr., Cabool; S. G. Kramer, Houston; M. B. Perkins, Willow Springs; E. C. Bohrer and Rollin H. Smith, West Plains; Fred Farthing and W. B. Johnson, Springfield.

The meeting was called to order by Dr. Connor, vice president.

Dr. Farthing spoke on "Chest Injuries" and Dr. Johnson spoke on "Hiatus Hernia." Both discussed conditions not well understood and gave treatments not undertaken until quite recently. Both papers were much appreciated.

Dr. Smith told of efforts to get a county hospital

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Surgical Anatomy & Clinical Surgery, Two Weeks, starting February 18 and March 17.
Surgery of Colon & Rectum, One Week, starting November 26, March 3.
Gallbladder Surgery, Ten Hours, starting April 21.
Basic Principles in General Surgery, Two Weeks, starting March 31.

GYNECOLOGY—Intensive Course, Two Weeks, starting February 18, March 17.
Vaginal Approach to Pelvic Surgery, One Week, starting March 3.

OBSTETRICS—Intensive Course, Two Weeks, starting March 3, March 31.

MEDICINE—Intensive General Course, Two Weeks, starting April 21.
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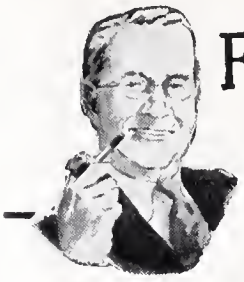
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From where I sit *by* Joe Marsh

Guess They Felt Pretty "Sheepish"

My wife and I went to Central City for the football game and it was a top-notcher. But I began to wonder if it was worth the trouble when we got in a traffic jam coming home.

Traffic makes me mighty impatient. When I came to a side road that seemed to point towards the main highway, I turned onto it. This road bumps along for maybe a mile or two, then fetches up short by the railroad spur—a dead end.

So, I turned around and darned if there weren't twenty cars behind me! One driver had followed—figuring I knew about a short cut—then a whole string of them swung after him, just like sheep.

From where I sit, it doesn't pay to follow just because someone makes a "new turn." Choosing a road, a political party, or the way to practice a profession should be up to the individual. The same goes for your choice of beverage—I like a glass of beer—but, most of all, I like the freedom of making up my mind about it!

Joe Marsh

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at West Plains and received a unanimous vote of approval and appreciation.

Dr. Bohrer brought up the subject of a four year medical school in connection with the University of Missouri. It was voted unanimously that the Society believes it should be in a metropolitan area rather than in a smaller city. Dr. Smith was asked to report this action to the committee of the Association.

The meeting adjourned to meet in Cabool on October 17. A. C. Ames, M.D., Secretary.

TENTH COUNCILOR DISTRICT

FRANK W. HALL,
CAPE GIRARDEAU, COUNCILOR

Forty-five physicians attended a dinner meeting of the Tenth Councilor District at the Country Club, Cape Girardeau, October 4. A social hour at 5:30 p. m. was followed by a steak dinner.

The scientific program was in the form of a clinical pathologic conference with the following discussants: Henry C. Allen, M.D., pathologist; Edward M. Cannon, M.D., urologist, and Robert Koch, M.D., internist, all of St. Louis.

The interesting case presented drew a great deal of audience participation throughout the discussion. A protocol of the case had been made available for study to those in attendance two weeks prior to the meeting. Frank W. Hall, M.D., Councilor.

BOOK REVIEWS

Textbook of Pediatrics, edited by Waldo E. Nelson, M.D., Professor of Pediatrics, Temple University School of Medicine; Medical Director of Saint Christopher's Hospital for Children, with collaboration of sixty-three contributors. Fifth edition with 426 illustrations, 19 in color. W. B. Saunders Company. Philadelphia and London. 1950. Price $12.50.

This book (1,658 pages) seems to be the outstanding work on clinical pediatrics at present. It is a good reference book for the general pratitioner and an excellent survey of pediatric procedures for the specialist. The medical student should be instructed in the value of pediatrics in the total field of medical care. The medical problem of infants and children is clearly expressed in the introductory chapters: "Time should be taken to think of the family in its total setting." The modern pediatrician is apt to forget this injunction in the study of any particular case.

The physical growth and development, illustrated with many drawings and curves, is extensively described in seventy-three pages. Perhaps because I have not used it sufficiently, I still believe that the Wetzel grid is a laborous and inpracticable means of obtaining some simple facts in regard to a child's growth. Nowadays, nothing seems reliable unless it is fortified with a mess of figures, and really growth has become overcharged with statistical material. Nevertheless, one has to admit that one figure is often more valuable than half a dozen clinical impressions. The drawings of the constitutional types and forms is a striking example that some statistics on growth are still unreliable.

I like the chapter on mental and emotional development. "A working hypothesis of behavior" is offered. This is incomplete. A section on the development of desirable traits is missing. What can be done to develop truthfulness, industry, frugality, ambition and even patriotism is not answered. The modern psychologist surely admits that rules for the development of a good character—not personality as is commonly understood—are still not formulated.

The active rules for infant feeding are restricted to a short article, while a description of vitamins covers many pages. Apparently the author proposes no definite formula for the feeding of infants. The many figures on the necessary constituents of the formula and also the quality, which fill a large space in the older textbooks, has shrunk considerably.

The sulfonamides and antibiotics are now the most valued ingredients of the medical armamentarian, and the lengthy discussion of these drugs is extremely valuable.

The prenatal factors in diseases of children are described in a comprehensive article. The pediatrician has found little use for the recent discoveries in genetics.

In recent years much study has been devoted to the newborn, and the cumulated knowledge is outlined extensively.

The principles of the diagnostic bacteriology are succintly described. It is clear that bacteriologic diagnosis must be reserved for the laboratory. I am glad to find the practical sense has not been clouded by an excessive quantity of pathologic data. Of course, the modern treatment by the sulfonamides and antibiotics is emphasized. Some of the directions in regard to treatment are too short for the practitioner. So many of the articles on the infectious diseases are too short compared with other comprehensive studies as diabetes mellitus and hypoglycemia.

There is no doubt but that the clinical physiology of many diseases has received considerable attention, as disturbances of fluid and electrolytic equilibrium, renal dysfunctions, metabolic and degenerative diseases of muscle, blood diseases. The short article on diseases of the oral mucosa, I think, is unsatisfactory, since it is such a common disease in children. About the same space is devoted to tooth disorders.

Yet it is an excellent treatise on disease of children and I recommend it. J. Z.

Normal Values in Clinical Medicine, by F. William Sundermand, M.D., Ph.D., Professor of Experimental Medicine and Clinical Pathology, University of Texas Postgraduate School of Medicine; Chief of The Department of Clinical Pathology and Director of Clinical research, M.D., Anderson Hospital for Cancer Research, Houston, Texas; and Frederick Boerner, V.M.D., Late Associate Professor of Clinical Bacteriology, Graduate School of Medicine, University of Pennsylvania, and Assistant Professor of Bacteriology, The School of Medicine, University of Pennsylvania; Bacteriologist, The Graduate Hospital of Philadelphia; Advanced Bacteriologist, Pennsylvania Department of Health. Illustrated. W. B. Saunders Company, Philadelphia and London. 1949. Price $14.00.

An encyclopedia of measurements for all constituents of the human body, This is a handy volume to have at hand, even at $14.00 per copy.

The authors believe it good practice to use the term "norm" for that selected range of values which can be accepted as a standard, and use the adjective

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"normal" for any measurement which falls within the "norm."

By comparison of selected figures for "norms," known to the reviewer by experience, it appears that the authors acquired their material from good sources.

The authors invite critical comment regarding errors of omission or commission, as well as suggestions for improvements or refinements, and future editions of the book should become increasingly indispensable.

This book also includes certain information such as statistical methods, actuarial tables, food values, and the like, that cannot be considered "norms." The authors state that these have been included for the reader's convenience, rather than for their essential pertinence.

R. E. D.

Cytologic Diagnosis of Cancer, The, by the staff of the Vincent Memorial Laboratory of the Vincent Memorial Hospital, A Gynecologic Service Affiliated with the Massachusetts General Hospital, Boston, Massachusetts. The Department of Gynecology, Harvard Medical School. Published under the sponsorship of the American Cancer Society. W. B. Saunders Company. Philadelphia and London. 1950. Price $6.50.

This 212 page book is of a condensed style and presentation and is easy to read. It is illustrated profusely with twenty colored plates and a hundred and forty-two black and white figures. All the illustrations in the book are of uniform magnification. The low power is comparable to a field seen with a 10 ocular and 4 magnification objective (40 magnification). The high power represents a field seen with a 10 ocular and 43 magnification objective (430 magnification). In addition to these there are scale drawings which remove the debri and increase the detail of depth in the field viewed, bringing a clear visual picture of the description given in the text. This uniformity is particularly effective when one wants to compare neuclear size of the various cells, or cell size with that of a scale polymorphoneuclear cell.

This text deals perhaps 50 per cent with the gynecological aspect of the vaginal smear technic of diagnosis of malignancy. It portrays first the normal cells and their variations in the normal process of degeneration; second the cell pictures of the various kind of uterine and cervical malignancies, and finally the bizarre cell changes following radiation. There are comprehensive chapters depicting the cells in respiratory diseases, gastric anomalies, urinary tract tumors and the normal and malignant cells in pleural and peritoneal fluids.

I find this publication extremely interesting and feel that anyone the least bit interested in cellular morphology from a diagnostic standpoint should read and consult this comprehensive book.

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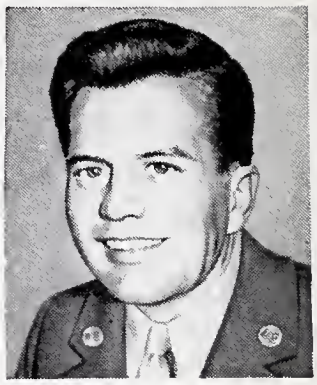




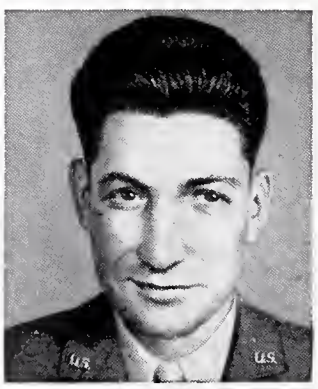
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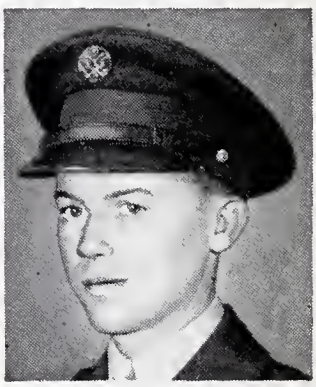
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Studies in psychosomatics have shown that functional disorders often are a result of the patient's inability to adjust to emotionally stressful situations (stressor factors).

Nervous tension and chronic anxiety, discharged through a labile Autonomic Nervous System, can cause somatic disturbance. [1,2] Such states may involve any one of the organ systems or several at one time. [1,3] The outline below is designed to relate gastrointestinal and cardiovascular symptomatology to the exaggerated response of the autonomic nervous system.

	Physiologic Effects of Autonomic Discharge	
	Sympathetic	Parasympathetic
Gastro-intestinal System	Hypomotility Intestinal Atony Hyposecretion Reduced salivation	Hypermotility Gastrointestinal spasm Hypersecretion
Cardio-vascular System	Rapid heart rate Peripheral vaso-constriction	Slow heart rate Vasodilatation
Functional Manifesta-tions	Palpitation Tachycardia Elevated blood pressure Dry mouth and throat	Heartburn Nausea-vomiting Low blood pressure Colonic spasm

The data here tabulated is from references [3,4,5,6,7], given below.

When the clinical picture is suggestive of functional disorder, the diagnosis is supported by the presence of the following indications of autonomic lability:

Variable Blood Pressure
Body Temperature Variations
Changing pulse rate
Deviations in B. M. R.
Exaggerated Cold Pressure Reflex
Oculo-Cardiac Reflex Abnormalities
Glucose Tolerance Alterations

Therapy in these cases is directed toward: 1) relieving the somatic disturbance to prepare the patient for psychotherapy*; 2) guidance in making adjustment to stressful situations and correction of unhealthy attitudes.

*Drug treatment using adrenergic and cholinergic blocking agents in conjunction with sedatives. [8,9,10]

1. Ebaugh, F.: Postgrad. Med. *4:* 208, 1948. 2. Wilbur, D.: J.A.M.A. *141:* 1199, 1949. 3. Williams, E. and Carmichael, C.: J. Nat'l. Med. Assoc. *42:* 32, 1950. 4. Goodman, L. and Gilman, A.: The Pharmacological Basis of Therapeutics, The Macmillan Co., 1941. 5. Katz, L. et al: Ann. Int. Med. *27:* 261, 1947. 6. Weiss, E. et al: Am. J. Psychiat. *107:* 264, 1950. 7. Alvarez, W.: Chicago Med. Soc. Bulletin, 581, 1950. 8. Rakoff, A.: A Course in Practical Therapeutics, Williams and Wilkins, 1948. 9. Karnosh, L. and Zucker, E.: A Handbook of Psychiatry. C. V. Mosby Co., 1945. 10. Harris, L.: Canad. M.A.J. *58:* 251, 1948.

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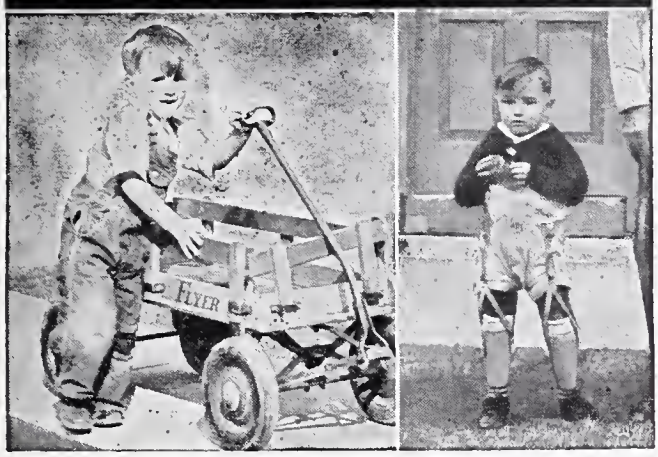


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1. *Smiles, William J.: Long-Acting Heparin Preparation: A Useful Adjunct in Anticoagulant Therapy. U. S. Armed Forces Med. J., Vol. II., No. 1 (Jan.) 1951.*

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References:

1 Krantz, Kibler and Bell: "The Neutralization of Gastric Acidity with Basic Aluminum Aminoacetate," J. Pharmacol. and Exper. Therap., 82:247 (1944).
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4 Holbert, J. M., Noble, Nancy, and Grote, I.W.: J.A.Ph.A., Scientific Edition, 37:292-294 (1948).

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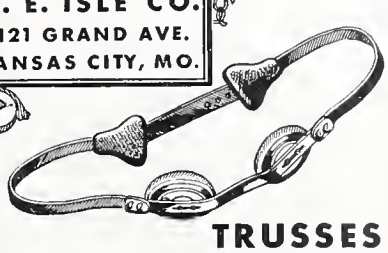
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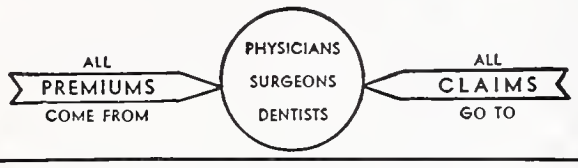
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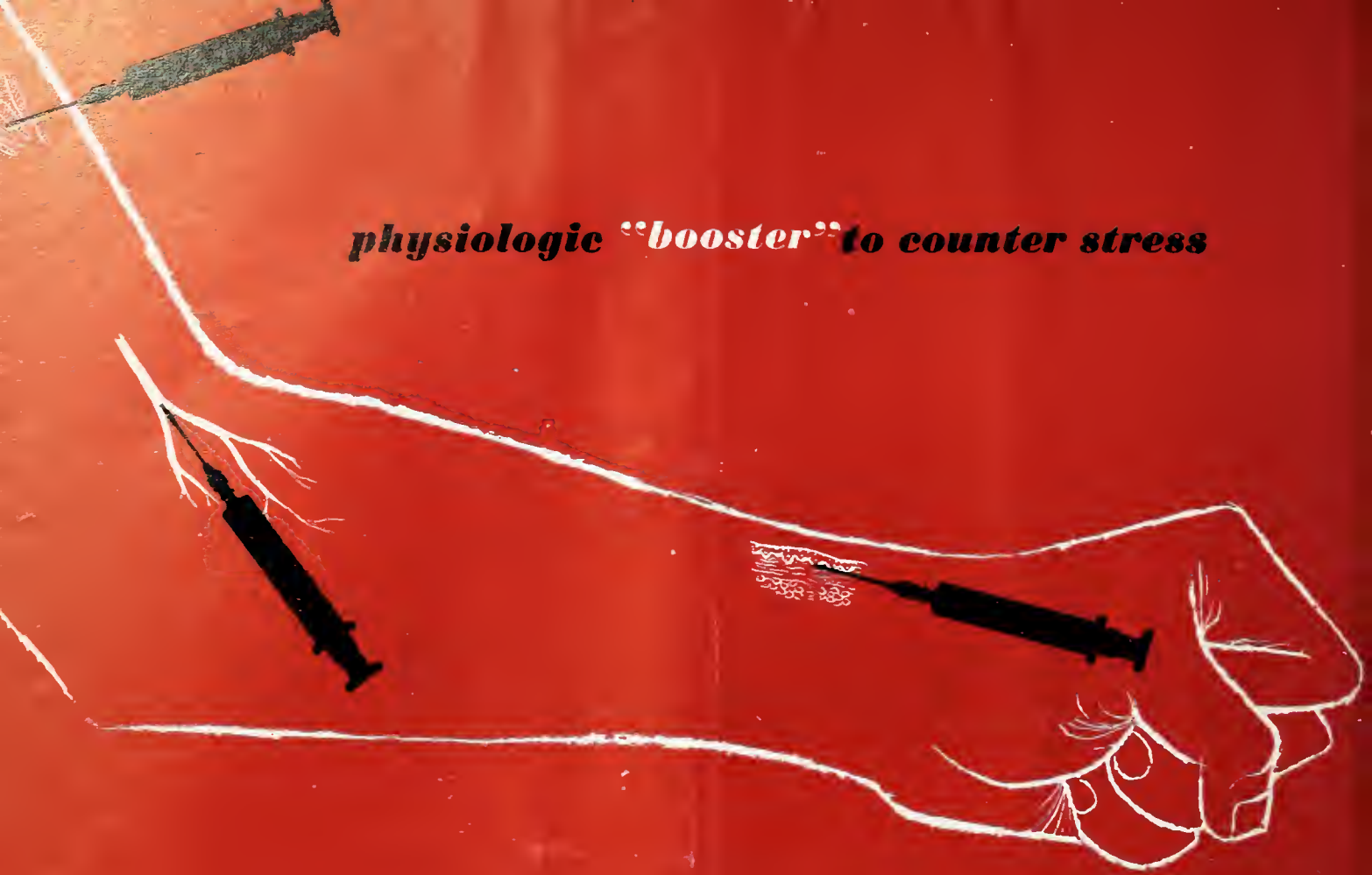
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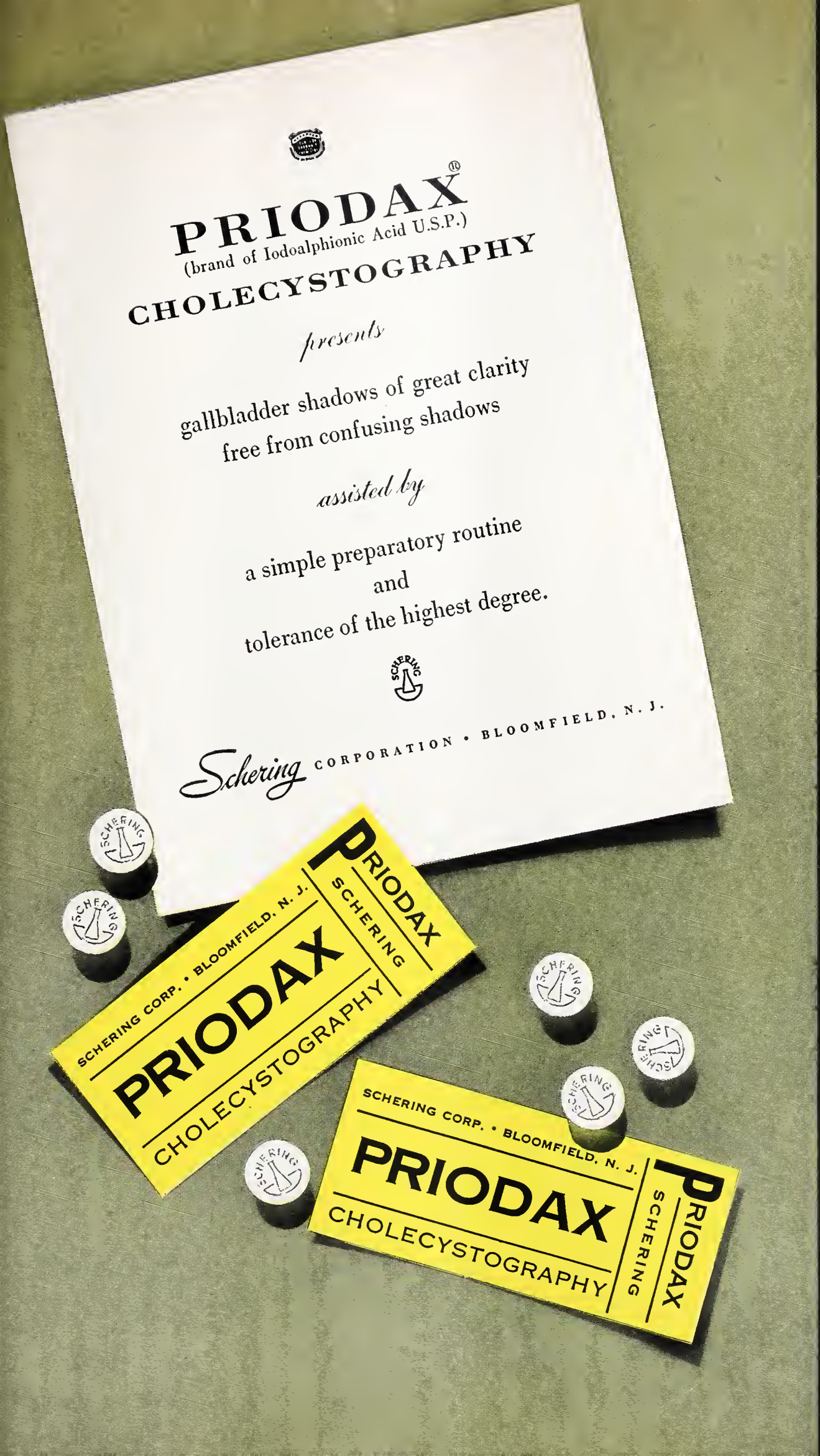
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Study of Cardiac Diseases—Glenn Hendren, Liberty, Chairman (1952); Drew Luten, St. Louis (1954); A. M. Estes, Cape Girardeau (1954); E. Lee Shrader, St. Louis (1953); A. Graham Asher, Kansas City (1952). **Associate Member**—H. W. Carle, St. Joseph.

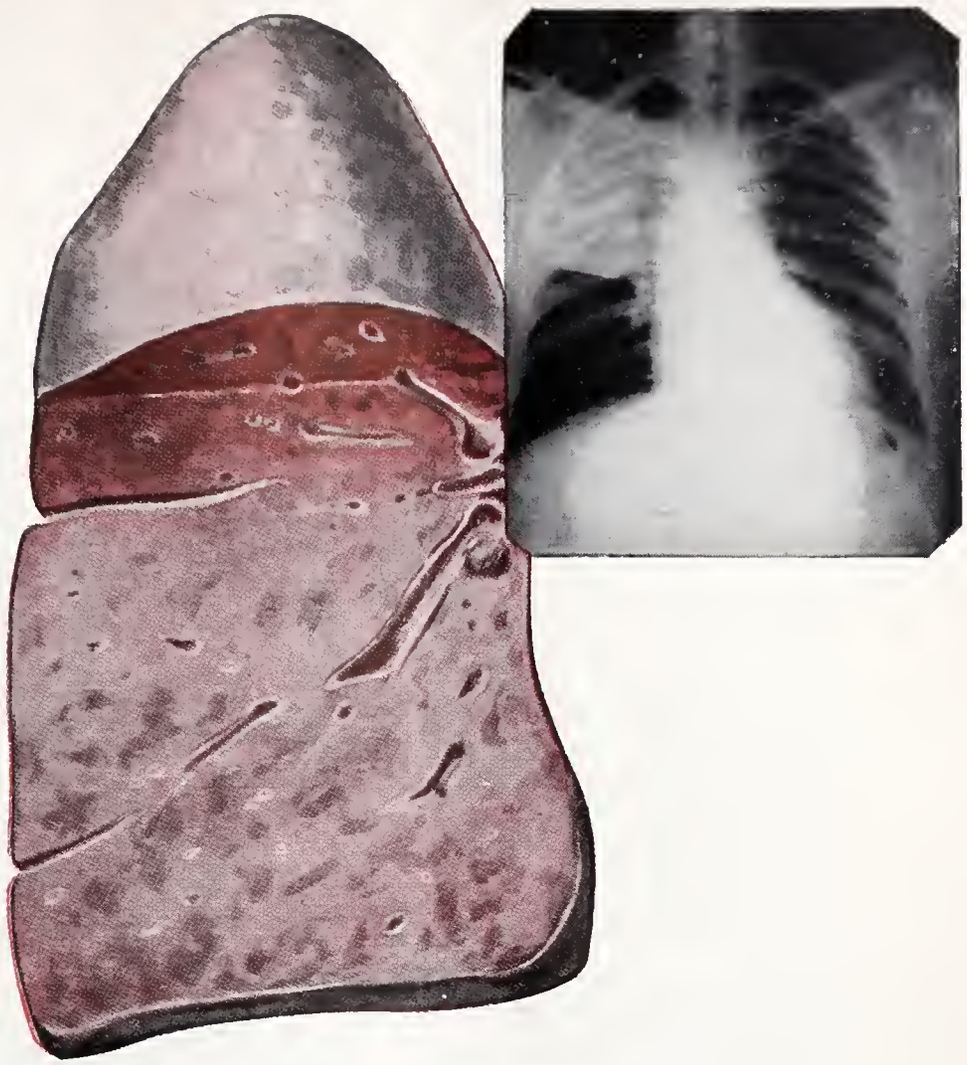
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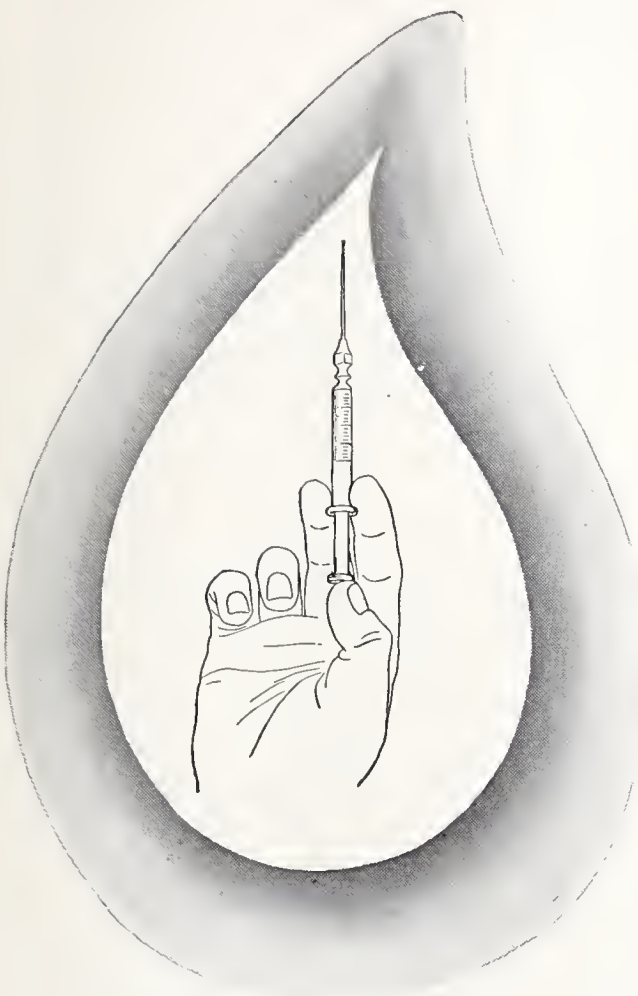
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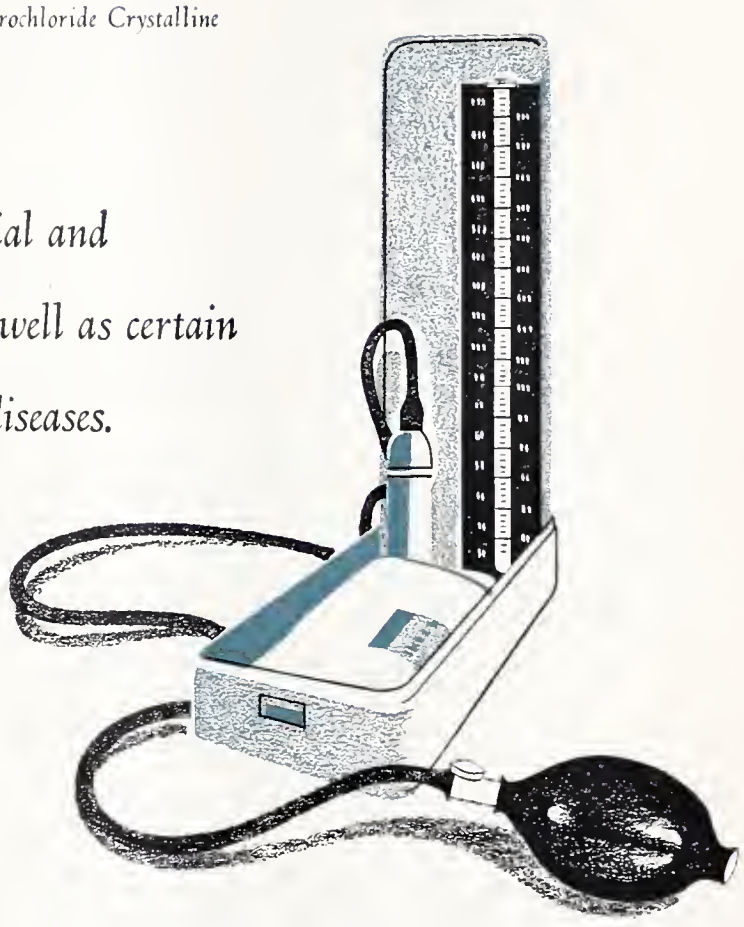
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**Gosselin, George A., M.D. Neurology and Physiology in Functional States Connecticut State Medical Journal 15: 109-113, (February) 1951*

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Volume 48 **December, 1951** **Number 12**

Scientific Articles

THE SPINAL PUNCTURE

DONALD F. COBURN, M.D.
KANSAS CITY

A SPINAL OR lumbar puncture is one of the most valuable procedures in the diagnosis and, to a lesser degree, in the treatment of pathologic conditions involving the central nervous system. A discussion of certain aspects of the procedure would seem timely in view of certain practices taught and employed.

The first report of a spinal puncture was in 1885, although the purpose of this puncture was to inject novocain rather than to obtain fluid for examination. Since that time the spinal puncture has been utilized for many purposes and, at the present time, its uses may be enumerated as follows: (1) measurement of intracranial pressure, (2) determination of an obstruction of the spinal subarachnoid space, (3) study of the spinal fluid contents, (4) drainage of spinal subarachnoid space to relieve intracranial hypertension, (5) introduction of therapeutic agents into the spinal subarachnoid space, (6) spinal anesthesia, (7) pneumoencephalography, and (8) myelography.

In order to allay any apprehension relative to the spinal puncture procedure, the physician should give the patient quiet assurance before starting. With one or two exceptions (pneumoencephalography and possibly spinal anesthesia) the puncture is done with the patient lying on his side, with the spine and saggital suture of the skull in the same horizontal line, paralleling the bed or table. A pillow may or may not be needed to properly align the head. Number 18, 19 or 20 gauge needles may be employed and, if the pressure is to be measured or if manometric studies are to be made, needles with the stopcocks permanently attached are the most helpful inasmuch as they obviate loss of fluid which results in faulty pressure determination. The third, fourth or fifth lumbar interspaces may be utilized for introducing the needle, and 1 per cent novocain solution may be injected intradermally and subcutaneously preceding the actual insertion of the longer needle. Holding the patient forcibly in a flexed position is unnecessary and should not be done unless he is irrational, as perhaps would be the case in the presence of an acute inflammatory or traumatic state. The patient should be told in advance that relaxation, as complete as possible, is essential; and one finds that this is more easily realized if the physician gives the patient an encouraging word when the actual insertion of the needle into the subarachnoid space has been completed. For one not too experienced in the procedure, it is advisable that he remove the stylet frequently in order to avoid penetrating the dura anteriorly, which would result in trauma to meningorachidian veins and subsequent bloody spinal fluid.

Manometric studies should be carried out in every case in which an obstructive lesion within the spinal canal is suspected. Apparently, many who routinely employ the Queckenstedt test fail to realize that compression of the jugular veins and blockage of escaping venous blood from the brain may well produce intracranial hemorrhage or medullary compression and a fatality in the patient who already carries an increased intracranial pressure. This practice is to be condemned as unsafe as well as useless, inasmuch as no information is gained by the Queckenstedt test in a patient who has a lesion other than an intraspinal one, unless it be relative to the patency of a jugular vein or to a lateral sinus where there is a suspected thrombosis.

The cell count and total protein determination are the two most valuable nonspecific tests of spinal fluid content. Cell counts should be done immediately following the removal of the fluid. The color of the fluid should be observed and the easiest method for detecting faint xanthochromia is to place equal amounts of water and spinal fluid in test tubes of the same size and, against a white background in daylight, compare them by looking through the fluids from the top of the tubes. If bloody fluid from a traumatic tap is obtained on puncture, correction of the white cell count can be made accurately by subtracting one

white cell per cubic millimeter of fluid for every 700 red cells per cubic millimeter in the fluid. Some of this fluid should be centrifuged and the supernatant fluid observed for color. If it is xanthochromic, it may be assumed that earlier hemorrhage other than that produced by the puncture needle has occurred. Likewise, correction for the total protein content of the fluid in a bloody tap may be made by subtracting 1 mg. of total protein from the figure obtained on the determination for each 750 red cells per cubic millimeter in the fluid. If the fluid is examined immediately after puncture and xanthochromia is present, neither of these corrections will be accurate. An increase of the total protein content of a specimen of spinal fluid serves as a warning or as an indication of some abnormal process in or about the central nervous system, this warning often not being reflected in any other test.

If it is properly employed, the procedure of repeated spinal fluid drainage in the management of patients with cerebral trauma is a most valuable one. It has been clearly demonstrated that the lessening of venous congestion by decreasing intracranial pressure with spinal drainage permits an increased utilization of oxygen from the carotid supplied blood. One must be cautioned against this therapeutic procedure unless careful observation is made of the optic disks for the presence of papilledema. If papilledema is present, the spinal puncture should be withheld.

Generally speaking, the removal of spinal fluid via the lumbar or cisternal route is contraindicated by the presence of papilledema unless the examiner is in a position to institute emergency surgical measures if the occasion demands; namely, ventricular puncture or craniotomy. Fortunately, death following spinal puncture is quite uncommon and almost all such fatalities are avoidable.

Some therapeutic agents such as penicillin and streptomycin may be injected intrathecally, but those who employ this route should be familiar with the potential irritative effects of these preparations and use such dosage as has been proved safe. Alcohol should not be injected intraspinally unless one is thoroughly familiar with the employment of it and the attendant dangers.

There are many excellent treatises relating to spinal anesthesia and no discussion of the subject is in order here. Complications or sequelae of this form of anesthesia, however, prompt me to stress the closest inspection of any type of solution or fluid to be injected intraspinally in order to avoid the use of a contaminated or improper agent.

Pneumoencephalography, although eliminated in many instances by the use of electroencephalography, is still a useful procedure. It should not be employed in individuals with papilledema, and it should be carried out by those familiar with the procedure. It is most valuable in the demonstration of cicatricial, atrophic or congenital lesions. Unfortunately, there is frequent failure in obtaining adequate visualization of the ventriculo-subarachnoid spaces in patients who have a space taking lesion.

Myelography has become a common procedure, and pantopaque is widely used for the intraspinal visualization. The advantages of this preparation over those of lipiodol have been published elsewhere, and it should suffice to say that pantopaque is much less irritating and is more easily manipulated than its predecessor. It is still deemed advisable to remove, if possible, all the injected pantopaque at the conclusion of the intraspinal visualization.

Spinal puncture is suggested frequently without the physician having an accurate understanding of what is sought by this test. He should determine those studies he desires to have carried out on the fluid before doing the puncture and remove the minimal amount of fluid necessary for those tests. By doing so, he will arrive at more accurate diagnosis, lessen the laboratory work and diminish the likelihood of a postlumbar puncture headache. If such a headache occurs, it is usually most rapidly relieved by keeping the patient recumbent and forcing fluids.

The thoughtful determination of information to be gained by a spinal puncture, coupled with reassurance of the patient and a carefully performed spinal tap, will aid materially in benefiting both the physician and the patient.

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EYE CARE IN BATTALION AID STATIONS

E. B. ALVIS, M.D.
ST. LOUIS

Eye injuries are important to the army. The eye is not a large part of the body but injuries which would be insignificant elsewhere often cause total disability for a long time when they happen to the eye. When the 21st General Hospital was acting as an Eye Center in Naples, 6 per cent of the battle casualties were eye casualties, and 4.8 per cent of the total admissions were eye cases. Of all the eye casualties (including disease and accidental injury) 49 per cent were unable to return to combat duty. Seventy-two per cent of the eye battle casualties could not return to that type of duty. Accidental injuries are frequent in forward areas (13 per cent of eye casualties) and costly, for 40 per cent of those seen did not go back to combat. From these figures it can be seen that a fair number of the wounded coming through an aid station will have eye injuries and that these must be treated with respect for they are a source of considerable loss of manpower to the army.

It is the duty of the Aid Station surgeon to sort those who should be evacuated to the rear from those who should not, and to get them all on the way as soon as possible. Pure eye casualties can usually be sent out as walking wounded. A man with both eyes bandaged can be led. However,

three quarters of the eye casualties will have some other injury, and in 20 per cent of them it will be of more immediate importance than the eye. These are usually general surgical or orthopedic problems.

What treatment can be given in the Aid Station and how the patients will be sent to the rear depends entirely on the battle situation. Pain and shock are not as severe problems in eye injuries as in many other types. Pain is readily controlled by morphine and local anesthetics and eye patients rarely go into surgical shock because of the eye injury alone.

Careless, optomistic prognosis by the first surgeon who sees a patient can be a source of great mental anguish and disturbed morale later on. One should be circumspect in telling an injured soldier about the future progress of his eye injury. If an eye must be removed the soldier should be so informed, preferably before the operation; but if this is not possible then as soon afterward as possible. It is quite a shock for a man to continue to hope for sight after an operation and then discover at some later hospital that the eye has been enucleated.

Any patient who is deeply unconscious must be watched for exposure of the corneas even if he has no eye injury. If he must be left without supervision or transported where supervision will not be constant the eyes should be closed with patches or the lids sutured. A single armed or a mattress suture placed near the center and penetrating halfway through the thickness of the lid and tied just tight enough to appose the lid margins will sometimes mean the difference between normal sight and blindness. No special equipment is necessary.

The types of eye casualties seen in a Battalion Aid Station can be divided roughly into eight groups:

1. *Glasses.*—Men who lose their glasses or who think they need glasses are more numerous in combat than one might think. They complain of headache, blurred vision, burning of the eyes, sensitivity to light and night blindness. Real malingering is extremely uncommon but exaggeration of real symptoms is common. In periods of light action or rest these men should be sent back for refraction if they can be returned to their own unit in from twenty-four to thirty-six hours. If longer separation is required they should not be sent back. A high percentage of these men will develop "hospitalitis" in from four to ten days and be permanently lost from their groups. Those who complain of night blindness should not be sent back without a note from their platoon or company commander and from the unit medical officer indicating that they are a menace to themselves and others because of objective signs of night blindness. Tests for night blindness are usually not available even in rear areas.

Testing the eyes of this group is chiefly important in that it helps maintain morale.

2. *Eye Diseases.*—As soon as the surgeon is convinced that a disease exists the patient should be evacuated to the rear. No facilities exist in Aid Stations for the treatment of eye diseases. One possible exception is mild conjunctivitis, but if twenty-four hours of treatment does not produce marked improvement, then these should be sent back also.

3. *Burns, Flame.*—Fortunately flame, even from gas and gasoline explosions, rarely burns the eyeball itself. It may burn the lids severely but the cornea and conjunctiva are usually not involved. These lesions are treated as burns of the face. One should also examine the eyes and the results of this examination should be recorded. The next doctor who examines the patient may find so much swelling that it will be impossible to determine the condition of the eyes. The examination need not be extensive. Simply look at the eye and ask the patient whether or not he can see as well as before the injury. If not, record on his emergency medical tag that the vision is impaired. If there is visible injury, apply atropine, antiseptic and local anesthetic before applying the final bandage. If a patch or part of a head bandage must cover the eye, be sure that the eye is closed before applying the bandage. Dry gauze touching the cornea is destructive.

4. *Burns, Chemical.*—In these cases the eye is frequently the only part seriously involved. The chemicals most commonly causing trouble are battery acid, ammonia, refrigerants, soaps and alkaline cleaning solutions. The treatment is the same for all—immediate irrigation with large quantities of water. If this is possible within the first few minutes, no serious damage usually results. The serious effects of alkalie burns are often not entirely evident for two or three days so care should be used in keeping them in forward areas. If the burn is severe enough for evacuation to the rear, atropine, anesthetic and antiseptic should be instilled in the conjunctival sac and a patch applied.

The arsenical gasses, mustard, nitrogen mustard and Lewisite, respond best to the application of BAL (British Anti-Lewisite). This will protect the eye or skin if used within the first two minutes and will help some if used within thirty minutes. After this length of time they should be treated as other burns are and sent to the rear. These chemicals are destructive to ocular tissue especially when they get into the eye in liquid form.

Phosphorus as used in warfare is usually the white form and is treated by brushing or picking off the particles and flooding the area with water. The eye or skin area is then treated like any other burn.

5. *Wounds near the eyes.*—These may cause damage by penetrating the globe or by rupturing it by blunt or transmitted force. Intra-ocular hemorrhage, acute glaucoma, tears in the retina and choroid, and detachment of the retina may all

accompany wounds of the cheek, brow, posterior orbit and skull without the eyeball being touched by the missile. Occasionally the optic nerve is severed or injured. The battalion surgeon is interested in these injuries only from a diagnostic point of view. Treatment is carried out in rear area installations. In any wounded soldier having an injury near the orbit, the eyes should be inspected and the visual acuity inquired about. Evidence for or against injury to the globe should be noted on his emergency medical tag.

6. *Wounds of the eyelids.*—These should be suspected of having eyeball injury and examined with this in mind. Only the smallest wounds should be treated in forward areas.

7. *Foreign bodies.*—(a) If few and superficial, that is, if they can be removed without disturbing more than a tiny spot of corneal epithelium, they should be removed. The tip of a 20 gauge needle makes a good foreign body spud. The eye should then be treated with an antiseptic and inspected in twenty-four hours. If it is not healed, the patient should be sent back.

(b) If many foreign bodies are present, as is often seen following mine explosions, the eye should be treated with atropine, antiseptic and local anesthetic, and the patient sent on back. These patients often do well with comparatively little treatment but they must be watched carefully and this can be done only in a hospital.

(c) If intra-ocular foreign bodies are present or suspected the patient should be sent to the rear. The diagnosis is often difficult and the treatment requires specialists with special equipment. Atropine, an antiseptic and a patch are all the treatment required in the aid station. One should be on the alert for intra-ocular foreign bodies. Many soldiers acquire them without knowing it.

8. *Penetrating and lacerating wounds.*—Men with penetrating and lacerating wounds of the globe should be evacuated to the rear. They should receive atropine, anesthetic, antiseptic and a patch, then be sent back quickly. If it is possible to use bilateral bandages and send them as litter patients, that is best.

If the iris or other uveal tissue has prolapsed through the wound, the prognosis varies directly with the size of the prolapse and the time it takes to get to the nearest hospital where it can be properly repaired. A small prolapse with proper repair in a short time has a fair prognosis. Any prolapse has a better prognosis if treated properly, even late, than one which is treated improperly any time.

If the eye is obviously lost, apply some antiseptic and a patch and send the man to the rear. Usually an anesthetic is not necessary. Enucleations are not emergencies and should wait until proper repair of the socket and lids can be done. With modern methods of evacuation this is often only a matter of hours.

One or more of these antiseptics should be available in ointment form: penicillin, bacitracin, aureomycin, terramycin, sulfathiazole or zinc sulfate. They are now put up in ophthalmic ointment tubes.

The commonest combinations of antiseptic and anesthetic are butyn and metaphen, and metycaine and merthiolate. Holocaine and epinephrin may be used for the anesthetic ointment. Pontocaine drops (½ per cent) or the ointment is an excellent anesthetic. It must not be used over long periods. Cocaine (2 to 4 per cent), if available, must be used with considerable caution because of its deleterious effect on the corneal epithelium.

Atropine is usually furnished in 1 per cent solution or ointment.

If one can have one of each of these groups of drugs and use a moderate amount of common sense one can give eye patients satisfactory front line care.

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SURGICAL TREATMENT OF ACHALASIA

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Achalasia or cardiospasm is a condition which has been thought to occur with relative infrequence. In the last few years, increasing recognition through greater awareness of this condition has demonstrated that the incidence of achalasia is much higher than earlier reports would indicate. It should be suspected in the patient who complains of dysphagia, this being the most common symptom and occurring second only to carcinoma of the esophagus as a cause for dysphagia.[1]

The term achalasia (without relaxation) evidently originated in Guy's Hospital, London, around 1913 when Hurst[2] found that a rubber tube filled with mercury could be dropped into the stomach and withdrawn without meeting spasm or other appreciable resistance. From this and other studies he concluded that dysphagia was caused by failure of the sphincter to relax rather than spasm of the cardia. Of the several theories propounded on the etiology of achalasia, none has been proved. Congenital spasm of the cardiac orifice of the stomach is a position no longer held. Actually, the level of stricture is usually at least an inch proximal to the cardia, being at the level of the esophageal hiatus. Reflex vagal irritation has been suggested as the etiologic factor, but recent observations following vagotomy[3] show no impressive results in contrast to earlier reports. An interesting observation by Rake[4] on autopsy material from three patients who had had achalasia showed destruction of the ganglia and connecting nerves of Auerbach's plexus in the region of the sphincter and to a lesser degree in the dilated wall of the esophagus. Other studies have shown the same findings with the suggestion that the gang-

lionic degeneration is due to dilatation, inflammation and fibrosis of the esophagus secondarily. The same contention has been advanced recently in the case of Hirschsprung's disease (congential megacolon).

Achalasia accounts for about 20 per cent of dysphagia,[5-7] rather an appreciable incidence. No age group is exempt, most patients presenting themselves in the third and fourth decades. Females are said to be affected twice as commonly as males.

Diagnosis of achalasia is chiefly by symptoms and roentgenologic examination since physical findings and laboratory examinations give little direct information. The symptom triad of pain, dysphagia and regurgitation of food is significant. The pain of achalasia in contrast to carcinoma of the esophagus may be rather severe. It is usually substernal and may radiate to the neck, to the angle of the jaw or to the mastoid region. It may come at any time but is more common during or after eating. Weight loss is common. Solid foods frequently may be easier to swallow than liquids. The patient may try to wash food down with liquids. Cold liquids are most poorly tolerated. Occasionally the spasm may be relieved by swallowing hot water. Regurgitation increases with the duration of the affliction. There is some danger present in regurgitation during sleep. Emotional conflict seems to

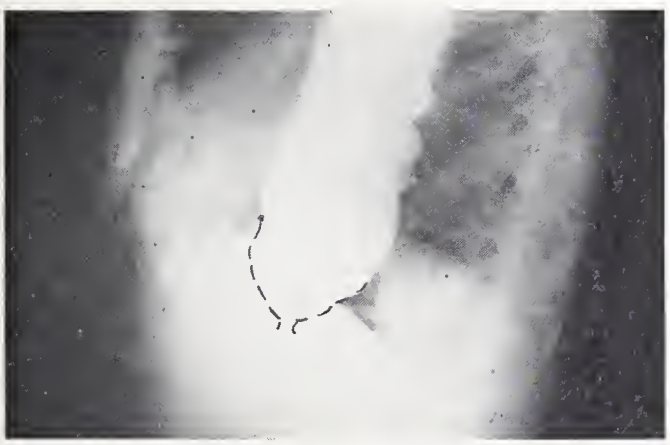


Fig. 1. Preoperative barium swallow shows the narrowing of the esophagus at the level of the diaphragm and dilatation above the point of stricture.

increase the symptom triad. While esophagoscopy is not recommended routinely due to possible trauma of the dilated friable esophagus, it may be done if there is uncertainty as to the presence of carcinoma.

The usual form of treatment has been the repeated use of bougies or hydrostatic dilators of various types. Psychotherapy in an occasional early case[8] may prove beneficial, but there is general agreement of its uselessness with established organic changes. Drugs of every kind are almost useless. Maingot,[5] while writing on the surgical treatment, states that medical management will cure 70 per cent, with improvement in an additional 20 per cent. Vinson[9] obtains complete and permanent relief from symptoms by passage of dilators or a bag in 75 per cent of patients. No author has stated how long treatment is continued before resorting to surgery, but most patients are treated by only a few dilatations.

In establishing the criteria for operability, there are several considerations. In any case in which there is doubt as to the diagnosis, surgical exploration is imperative to rule out carcinoma at the cardia or lower end of the esophagus. If there has been no response to a series of dilatations, operation is indicated. Dilatation may be hazardous when there is great dilatation of the esophagus, the flask shaped deformity which may sag and stretch.

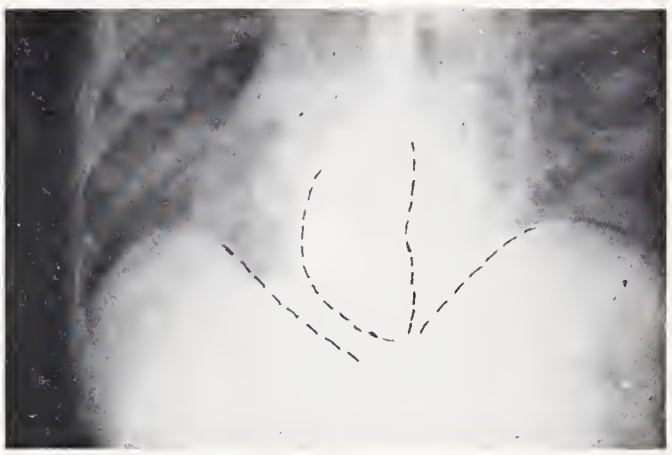


Fig. 2. Postoperative film shows residual dilatation of the stretched esophagus. Diaphragm is sketched.

Several types of operative procedure have been described. The technic used in the two cases to follow is that of Wendel[10] which is comparable to the Heineke-Mikulicz pyloroplasty. A single longitudinal incision into the lumen of the lower esophagus is continued through the anterior wall of the cardia of the stomach. This longitudinal incision is then retracted laterally and sutured transversely to perform a cardioplasty.

CASE REPORTS

Case 1. F. U., 47 year white male, was seen seven years ago because of difficulty in swallowing food. It had been necessary for him to wash down his food with swallows of water and during the ten days prior to admission on March 23, 1944, he was able to swallow only liquids. That was the third and most severe such episode, dating back an additional six years to a serious emotional upset occasioned by a drowning at which he nearly lost his life. Physical examination on admission in 1944 was not remarkable except for emaciation (weight loss of 50 pounds). Barium swallow at that time showed the esophagus to be quite large and obstructed without filling defect near the cardia. At the end of six hours only a trace of barium had passed.

During his three week period in the hospital he was dilated daily by an otolaryngologist with graduated bougies. His symptoms disappeared and after his discharge dilatations were carried out twice a month for a while, while remaining symptom-free and gaining weight. Dilatations become less frequent, being made once or twice a year for minor recurrence of dysphagia.

For a year and a half before his second admission

he began to notice increasing severity of vomiting about forty-five minutes after eating. Emesis was large in amount and his weight again began to drop. He was taking atropine before meals but the dysphagia and regurgitation increased. Nine days prior to admission, increasing dysphagia had forced him to soft foods. Four days before admission he could swallow nothing without immediate and apparently complete regurgitation. He was then dilated by the otolaryngologist but was too weak to continue further out-

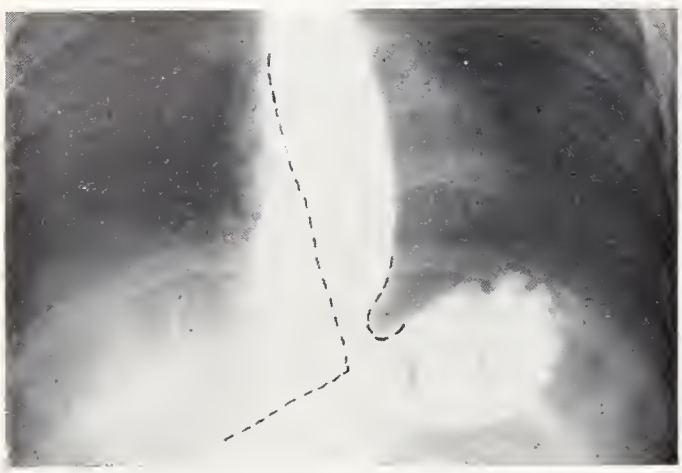


Fig. 3. This case does not show advanced dilatation as barium flows slowly through the area of narrowing.

patient therapy. His weight had dropped from 180 to 130 pounds.

Hospital admission on April 18, 1950, showed a weak, undernourished, dehydrated man. Hemoconcentration was evident by Hb. 115 per cent; red blood cells, 5,750,000; white blood cells, 12,000. Barium swallow on admission showed complete closure of the distal end of the esophagus. A tube could not be passed into the stomach. Twenty-four hours later the tube, which had been left in place, was found to have passed the cardia. In the next few days the spasm had relaxed to permit more adequate fluoroscopic examination (fig. 1). Operation was performed on May 9, 1950, after the patient had been prepared by high protein diet, vitamin supplements, antibiotics and blood transfusions. Esophageal lavage for two days preoperatively was done.

Cyclopropane anesthesia through an endotracheal tube was used with the patient lying in the right lateral decubitus position. A left transpleural approach was made through the bed of the eighth rib. The lung was retracted after collapse and severing the inferior pulmonary ligament. The lower esophagus was exposed by incising the overlying parietal pleura. The greatly dilated lower portion was then freed up by blunt and sharp dissection. The esophageal hiatus was enlarged by dividing the diaphragm partially in order to expose the cardiac portion of the stomach. After adequate exposure was had and the area packed off, a 10 cm. longitudinal incision was made through the anterior aspect of the lower dilated portion of the esophagus and cardia, with the point of constriction being in the middle of the incision. The longitudinal axis of the incision was changed to a transverse one by retracting the midpoints of the incision to each side. The closure was effected by using a deep row of 000 catgut intestinal suture, Connell stitch and a superficial row of the same material with a Lembert stitch. A Levine tube was guided through the esophagus into the stomach and the diaphragm was closed. Closure was completed with a pleural catheter hooked to a water seal drainage bottle.

Streptomycin and penicillin were given in the immediate postoperative period along with early ambulation. A particularly smooth course followed. On the fourth postoperative day the chest drainage catheter was accidentally pulled out by the patient's turning in bed. The nasal tube was removed on the fourth postoperative day and liquid feedings were begun. By the seventh postoperative day the patient was completely ambulatory and was given a soft diet. Fluoroscopy with barium swallow on the tenth postoperative day showed moderate obstruction thought to be due to edema although the barium passed well, and the patient was asymptomatic on his discharge on the eleventh postoperative day.

Soon after leaving the hospital he resumed his occupation as a grocery order clerk. He gained 30 pounds in the next three months. Four months after operation fluoroscopy showed residual dilatation but the barium passed readily (fig. 2). About seven months after the operation he began to have symptoms of "greasy" indigestion three hours after the evening meal. He had noticed some tarry stools. The symptoms were highly suggestive of peptic ulceration as the dyspepsia assumed a pain—food—relief cycle, and Banthine afforded considerable relief. However, an increasing pallor with exertional dyspnea caused the patient to be hospitalized again for evaluation.

Admission on March 26, 1951, showed an anemia, Hb. 44 per cent; red blood cells, 2,390,000; white blood cells, 7,150. After 500 cc. whole blood on three days his color improved and weakness disappeared. Stool studies for occult blood were negative. Since his discharge he has felt well, complaining only of mild dyspepsia and gas which may be controlled by between meal crackers and milk. Barium studies have shown no evidence of peptic ulcer and no residual.

COMMENT

This patient represents well what may happen if allowed to progress with periodic dilatations over a period of years. Once there are organic



Fig. 4. Postoperative barium swallow shows media flowing quickly through the cardia.

changes in the wall of the esophagus due to prolonged dilatation, the esophagus does not recover its normal size. There may be symptoms from chronic esophagitis which undoubtedly account for the marked anemia in this man, since no other organic lesion was demonstrated in the gastrointestinal tract. The dyspeptic symptoms are probably due to esophagitis. It is hoped in this particular case that the symptoms, though mild, may disappear since there is no evidence of obstruction a year after operation.

REPORT OF CASE

Case 2. M. K., 34 year white male, was admitted to the hospital for study on April 17, 1950. His principal complaint was a substernal fullness and salivation

while lying in bed asleep. For five years previously he had to eat slowly, waiting for food to go down. There was no regurgitation. A glass of water gave particular trouble. After several minutes he could feel the food passing into the stomach. Melena was not noticed. Two years prior to admission he had been dilated monthly for six months. Each dilatation afforded relief for only two or three days following. Mild sedation and belladonna allowed the patient to eat normally most of the time before his entry to the hospital until more recently. It became difficult for him to eat away from home due to embarrassment from dysphagia.

Physical examination was not remarkable except for obvious weight loss (history of 25 pounds loss in two years). Admission blood count was normal, Hb. 90 per cent; red blood cell, 4,640,000; white blood cells, 5,400.

Fluoroscopic examination with barium swallow (fig. 3) shows a marked narrowing at the cardiac end of the esophagus with considerable dilatation. Food mixed with barium at first suggested a diverticulum of the esophagus but reexamination showed only the cardiospasm. The patient was placed on a routine of high protein, high caloric diet and antibiotic preparation before operation.

Operation on April 27, 1950, by the Wendel esophago-cardioplasty was carried out in the same manner as in Case 1 except for left phrenic emphraxis. It was noted that the Wendel operation permitted enlargement of the esophageal constriction by two and one half times. Whole blood, 1,000 cc., was given through the procedure which was well tolerated. The postoperative course was uncomplicated, early ambulation being practiced with the patient out of bed from the first postoperative day. Penicillin and streptomycin were given the first week after operation. On the sixth postoperative day the Levine tube and pleural catheter were removed. By the eighth postoperative day he was swallowing well and was placed on a soft diet. Barium swallow on the ninth postoperative day showed barium passing readily through the lower esophagus. He was discharged on the twelveth postoperative day.

Figure 4 shows marked diminishing of esophageal dilatation four months after operation and rapid passage of barium into the stomach. One year after operation there has been a weight gain of more than 20 pounds with relief of symptoms. He eats a normal diet and takes no medicine. His only symptom is an occasional transitory mild upper epigastric burning.

COMMENT

This case was not as far advanced with regard to organic changes from prolonged dilatation and presented a better prognosis. Both patients feel that the operation was well worth while. Though the first case still has some dyspepsia, this has been controlled adequately by medication. Both men are actively engaged in their normal occupations.

SUMMARY

A brief review of achalasia has been presented along with case reports of two patients who were treated surgically after failure of more conservative efforts. While several operative technics have appeared in the literature, the Wendel esophago-cardioplasty was used in the treatment of these two cases to the satisfaction of the operators.

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A NEW AGENT FOR THE TREATMENT OF MIGRAINE AND HISTAMINIC CEPHALALGIA

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DURING THE last few years several new preparations have been used in the symptomatic treatment of migraine and histaminic cephalalgia. The more successful drugs now on the market for the treatment of these two vascular types of headache are Cafergot, D.H.E.-45, Octin and Valoctin. These preparations are used primarily to abort the headache attacks. The first report on Cafergot was made in 1948.[1] Further reports on Cafergot were made in 1949 and 1950.[2, 3] The first report on D.H.E.-45 was made by Horton[4] in 1942 and Peters[5] reported on Octin in 1949. All reports on these drugs for the symptomatic treatment were consistent in one thing, all drugs produced some side effects of mild nature and a certain number of cases would not respond. The percentage of failures varies with each individual agent.

I have stated before[6] that it is my opinion that it is a tension element which causes these failures. The tension factor is far more pronounced in the average migraine case than in the average histaminic cephalalgia case. In most of the reports on these preparations, the greater number of failures are found in the migraine group and not in the histaminic cephalalgia group. If a true breakdown of most migraine cases were made, I believe that a majority of them would be found to consist of a combination of migraine and tension.

Many migraine patients experience so much nausea and vomiting with attacks that it is practically an impossibility for them to retain any type of medication taken orally. This, plus the fact that absorption through the stomach is poor following nausea and vomiting, has led to the idea of the rectal suppository form of administration. A previous report was made on four types of suppositories used in migraine and histaminic cephalalgia which were found to be not too successful.[6]

In dealing with the tension element in these migraine patients, the most logical solution is, of course, to remove the cause of the tension. However, this is often easier said than done be-

cause in most of the cases the tension factor ties in with the patient's occupation, home life, age or other factors which are not too easily changed in any complete form, although some minor adjustments can be made in most of the cases. Another method by which the tension factor can be combatted is by a mild sedative. The ergotamine tartrate and caffein combination has proven effective in relieving the headache phase of this problem. The addition of bellafoline to Cafergot (ergotamine tartrate and caffein) seems to cut down the gastric side effects in some cases.[7] Ergotamine tartrate is a sympathetic sedative and caffein is a central stimulant. Bellafoline acts as a parasympathetic inhibitor, relieving smooth muscle spasm and controlling hypersecretion.[8] Bellafoline has been found to be less toxic than similar drugs used at the same dosage level.[9]

Therefore, in discussing the preparation for this new agent to be used in migraine and histaminic cephalalgia, I suggested that in addition to the three drugs, ergotamine tartrate, caffein and bellafoline, a sedative be added to try and combat the tension factor. A new agent was prepared which contained 2.0 mg. ergotamine tartrate, 100 mg. caffein, 0.25 mg. bellafoline and 60.0 mg. pentobarbital sodium. This preparation was made in the rectal suppository form and is known experimentally as E.C.B.P.-163.

In many cases it was rather confusing to the patient when he was told to take a preparation rectally for the purpose of relieving his headache attack. It should be explained to the patient that this suppository will in no way act as a laxative but is merely intended to help relieve the headache attack. It should be explained further that the suppository should be taken as soon as possible after the headache attack starts. One suppository seems to be the best average dosage.

Another effective oral preparation, besides Cafergot, is E.C.B.-210, which as yet is not on the market. This preparation is the same as Cafergot except that it contains 0.125 mg. bellafoline. An attempt will be made to compare the results obtained by using E.C.B.P.-163 with those previously obtained by this author with Cafergot and E.C.B.-210.

The average dosage of the oral preparations was found to be two tablets at the immediate onset of the headache attack. The dosage of the suppository form is one suppository taken at the onset of the attack. However, it does not seem necessary that the suppository be taken at the immediate onset of the attack. In many cases the patient was unable to take the suppository immediately but it seemed to work about as well. This in itself is a great advantage of E.C.B.P.-163 over the oral preparations.

The reason, of course, for the continued research in the field of headache is to find a preparation which will be successful in aborting the attacks but which will produce little of no side effects.

The initial results, reported in this paper, are remarkable especially in regard to the gastric side effects. Cafergot produced gastric side effects in about 11 per cent of the cases reported[3] and E.C.B.-210 produced these same gastric side effects in about 5 per cent of the cases studied.[7] However, with this new agent, E.C.B.P.-163, there was not a single case of gastric side effect reported. However, a large percentage of the patients who used E.C.B.P.-163 did experience side effects. In fact, 60 per cent experienced a tired or sleepy sensation to various degrees. Some of the patients felt only a "little sleepy" while others felt the sedative effect much more and slept for two or three hours. The usual report was that the patient took the suppository and about twenty or thirty minutes later the headache began to be less severe but they felt sleepy. They would sleep usually from one to three hours and then they would awaken entirely free from the headache. The sedative side effects usually were no longer present when the patient awakened. It seemed that the degree of this sedative side effect was in direct proportion to the patient's size and body weight. The larger male adults experienced no sedative effects at all. This side effect was the only one produced by this new agent, E.C.B.P.-163, and the greater majority of true migraine and histaminic cephalalgia patients are rather desirous of rest after one of their attacks and most patients were not at all alarmed or disturbed by this sleepy sensation when it did occur. Many real migraine and histaminic cephalalgia patients are near the exhaustion stage following an attack and perhaps this side effect helps in the "recovery" stage.

Table 1 shows the percentage of side effects obtained when using E.C.B.P.-163 and those obtained with the two oral preparations.

Table 1. *Side Effects*

Drug Used	Cases	Gastric Side Effects		Sedative Side Effects	
		Number	Per Cent	Number	Per Cent
Cafergot	201	22	11	0	0
E.C.B.-210	100	5	5	0	0
E.C.B.P.-163	40	0	0	24	60

E.C.B.P.-163 was found to be superior to both Cafergot and E.C.B.-210 in relieving the headache attacks of both the migraine sufferer and the patient suffering with histaminic cephalalgia. There were many patients who were in the failure groups with the other preparations but who obtained excellent results with E.C.B.P.-163. On the other hand, there were some patients who obtained excellent results with E.C.B.P.-163 and then were given Cafergot or E.C.B.-210 for the first time and failed to obtain the desired relief. From this comparison it seems that a great advancement in the symptomatic treatment of mi-

graine and histaminic cephalalgia has been achieved.

Table 2 compares the results obtained with the oral preparations, previously reported, and those with E.C.B.P.-163.

Table 2. *Comparison of Results*

	Migraine Results				Histaminic Cephalalgia Results			
	Number Cases	Excellent	Good	Poor	Number Cases	Excellent	Good	Poor
Cafergot	110	81	18	11	46	37	5	4
E.C.B.-210	63	51	5	7	25	20	3	2
E.C.B.P.-163	32	28	2	2	8	7	1	0

Excellent indicates complete relief.
Good indicates partial relief.
Poor indicates little or no relief.

REPORT OF CASES

An example of the successful use of E.C.B.P.-163 in a case of histaminic cephalalgia, as described by Horton,[10] is that of T. T., a married, white, 39 year old male. He was a high pressured businessman who had unilateral headaches of short duration. His attacks would commence and terminate rather suddenly and frequently he would be awakened from his sleep by an attack a few hours after he had retired. Sitting up or standing often would ease his attacks but would not relieve them completely. With his attacks he had nasal congestion on the side involved (right), rhinorrhea and stuffiness of the right nostril. On occasion, he also had congestion of the right eye and swelling of the right temporal vessels. Severe pain was the chief complaint, it being constant, severe and boring in character, involving the right frontal area just above the eye. His report of an attack in which this patient successfully used E.C.B.P.-163 is as follows: The patient had had an exceptionally heavy day at his office and went home tired. He retired about 11:00 p. m., his usual hour for doing so. At about 2:45 a. m. he was awakened suddenly from his sleep with a severe pain over the right frontal area. The right temporal vessels were engorged. The right nostril was congested and the right eye was watery and congested and had a burning sensation. The pain was boring and severe. At 3:00 a. m. he took one suppository of E.C.B.P.-163 and fell asleep in about twenty minutes. At about 5:00 a. m. he awakened and the pain was completely gone and the vessels in the right temporal area were no longer swollen and engorged. The right eye felt normal and the mouth and nose felt dry. He felt a little drowsy at that time and this feeling continued until about lunch time but it was not severe enough to interfere with his work. He had no signs of headache.

This case is of a typical severe attack of histaminic cephalalgia which was relieved completely by the taking of one suppository of E.C.B.P.-163. This patient received histamine injections according to the method advocated by Horton.[10]

An example of the successful use of E.C.B.P.-163 in a case of migraine is that of M. S., a single, white 38 year old female. Her headache was usually associated with nausea and sometimes with vomiting. Photophobia was often present along with scotomata. It was a periodic type of headache and the duration was usually for many hours or even a few days. There is a family history element in her case and her attacks are more severe during or just preceding her menstrual periods. She is a conscientious person with a responsible position. When she has had a hard, tense day at the office she usually has some form of headache attack that evening or during her early sleeping hours.

A typical account of her use of E.C.B.P.-163 follows: She awakened at 6:00 a. m. with pain in the eyes, across the forehead and the top of the head. The pain subsided slightly after she had had breakfast but it did not leave entirely. By 9:00 a. m. the pain was much more intense, at which time she took two Cafergot tablets. At 10:00 a. m. she took another one. She worked hard and continuously all day and, while the pain lessened, it did not entirely leave. By 4:00 p. m. the pain became much more severe and was mainly on the left side of the face and head. At 6:00 p. m. she had dinner. By 7:00 p. m. the pain was extremely severe with a nervous reaction. Her stomach was upset and she was nauseated but was unable to vomit. At 10:00 p. m. she took one suppository of E.C.B.P.-163. In about twenty minutes she was slightly drowsy and went to bed. By approximately 10:30 p. m. she had fallen asleep. She slept for about three hours and awakened completely relaxed and the upset stomach, pain in the head, neck and face had vanished completely. She stayed awake for about a half hour then went back to sleep. She slept until 7:30 a. m., at which time she had no pain and felt fine throughout the day. This patient also received histamine injections according to the method used by Horton and the frequency and severity of her attacks were lessened. In this case in which Cafergot failed, E.C.B.P.-163 definitely was successful in relieving this typical migraine headache attack.

These two cases serve to illustrate the typical uniformly good results that were obtained in most of the cases reported in this paper. This is a preliminary report and more investigative research work remains to be done with this preparation, but it seems that E.C.B.P.-163 is far superior to all other preparations which have been used to abort attacks of migrains and histaminic cephalalgia. The results obtained show that the addition of a sedative to the ergotamine tartrate caffein and bellafoline was a tremendous step in the advancement of the treatment of these two types of headaches. The results further show that perhaps the theory of a tension factor being the causative agent for the many failures met in the treatment of these two types of vascular headache may be the correct solution.

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THE PHYSICIAN AND ORAL HEALTH IN CHILDREN

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Many articles on oral health have appeared in the dental journals but relatively few have been published in the most commonly read pediatric and general medical literature. This has been true in spite of the increasing emphasis being placed on total child health. Any health program must give as much importance to oral health as it does to the other factors that go into the makeup of a healthy and happy child. Far too often the physician has left to the dentist the entire responsibility for oral health. In such situations the mother has had to use her own judgment in what constitutes good oral health and when to approach the dentist. Too few parents appreciate the importance of preventive dentistry, particularly during the preschool years when it has greatest value. By that time there may have been a toothache, an apical abscess or several carious teeth. Unfortunately, in young children, dental caries and tooth infections are too often painless so that attention is not sought until such processes may have become extensive.

In this discussion I would like to consider only those problems which are related to the teeth. If one considers dental caries a disease, then one must realize that dental disease is the most prevalent of all disease processes. It is no respector of age, income or special groups.

Although statistics as to the prevalence of dental caries have been reported for years, sufficient importance has not been given to these figures. This may be true because thought has been only in terms of brushing the teeth and repair rather than in terms of prevention and proper care. McCall[1] in 1938 found that 50 per cent of 2 year old children examined at the Guggenheimer Clinic in Boston had one or more carious primary or deciduous teeth and that 60 per cent of 5 year old children examined had seven or more cavities and one or more teeth needing extraction. A later study in a less metropolitan community at the University of Iowa[2] showed that the caries incidence was 1.1 at 2 years, 2.7 at 3 years, 4.0 at 4 years and 4.1 at 5 years of age. There are about 11,000,000 children under 5 years of age in this country which means that about 2,200,000 reach the 2 year old level each year. From this one can estimate the tremendous problem of dental repair alone when one considers that there are only 70,000 dentists available.

It would seem only logical then that more emphasis must be placed on prevention and proper repair in an attempt to cut down on the caries rate. Such a program must involve the physician. He is the first to have contact with the parent and child and thus can give advice as to recommended methods of oral hygeine, caries prevention, early recognition of tooth abnormalities and diseases, malocclusion and dental repair.

All have an obligation to society which must be borne equally by the physician and the dentist. Pediatric dentistry is making rapid advances, not only in caries repair and treatment of infections but also in research on the initiation of dental caries. Medical care should include an examination of all the structures in the mouth. Far too often only the tonsils and the tongue are considered. There has been poor observation when no mention is made of the condition of the teeth, gums, gum boils and malocclusion. Attention is paid to an apical abscess with cellulitis because of the pain, swelling and evidence of acute distress, but the apical abscess with a gum boil is usually ignored.

Medical schools give too few instructional courses in dental health. How then does one learn about such conditions? From questioning physicians I find that such knowledge comes from the limited number of articles appearing in medical journals, by experience after years of practice and from the limited amount of information given by one's own personal dentists while in the dental chair. In order to do justice to young patients one should be so well informed that he can give intelligent advice on hygeine, prevention and what is considered adequate dental repair.

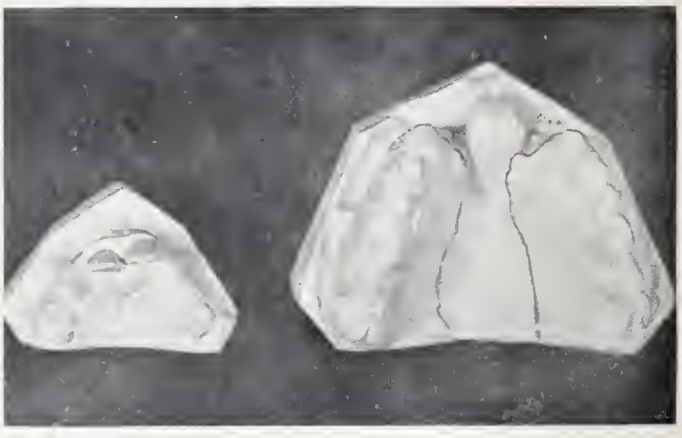


Fig. 1. Casts of the maxilla of two 10 year old children with congenital cleft lip and cleft palate. At left is represented the undersized maxilla after surgery started in early infancy. At right is the normal growth and dentition of the maxilla of a child who had no surgery of the palate. This demonstrates good growth potential when not interferred with by early surgery.

An unhealthy mouth may not only be unsightly, producing severe emotional and behavior patterns, but also produce malnutrition and disease.

THEORIES ON INITIATION OF DENTAL CARIES

Much research has been done during the last several years on the causation of dental caries. The preponderance of evidence favors some combination of fermentable sugars and bacterial action. Dental caries is an environmental disease and the influencing factors seem to be a balance be-

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From The Children's Memorial Hospital and Northwestern University Medical School.

tween the rate of acid formation in the mouth and the rate of neutralization. The present theories of caries initiation are as follow:

1. Excess of fermentable carbohydrates in the diet.

a. Especially in-between meals and before bedtime.

b. Such foods are usually soft and sticky and are retained between the teeth that are not self cleansing.

c. Fermentable sugars furnish a substrate for the growth of bacteria which in themselves are capable of initiating processes that cause decalcification.

d. Fermentable sugars may form a substrate for the formation of acids that cause decalcification.

e. They may offer optimal bacterial enzymic action.

f. They may cause an increase in the growth and metabolism of bacteria that act deleteriously on the teeth.

g. They may dilute the diet so that the consumption of protective foods is below normal.

2. Bacterial Flora. Incriminated most has been the lactobacillus acidophilous. It has been suggested that they act on the tooth enamel to hydrolyze glycoproteins, releasing an acid which causes decalcification.

3. Changes in the physical, morphologic and chemical characteristics of the enamel surface.

a. Malocclusion may cause retention of food between the teeth as well as irritation of the gums. Pits and fissures may offer surfaces for dental decay.

b. The normal development of the tooth may be changed by deficiency diseases and infection during the formative period.

c. The maternal diet.

d. Heredity.

4. Saliva, its amount, rate of flow, viscosity, buffering capacity and the protective substances it may contain.

5. Oral hygeine.

6. Restorative dentistry.

Most research at present tends to show the importance of fermentable sugars in dental caries initiation[3, 4] whether this be due to the formation of a substrate, acid formation or as a media for increased bacterial growth. The proponents of these theories, and they are in the majority, claim that the fermentable sugars act as a substrate for acidogenic bacteria and their enzymic systems which then form acids which act upon the tooth enamel and then cause decalcification and the initiation of dental caries.

It has been demonstrated that within one and one half minutes after the taking of a fermentable sugar into the mouth the pH of the tooth surface falls from 7.0 to 5.0 The taking of such sugars at mealtime is not so harmful because of the chewing, dilution and washing that takes place with other fluids and foods. It is not a matter of how much sugar but of how often. The average American has a "sweet tooth." The necessary carbohydrate calories are furnished by forty pounds of sugar a year, yet the average consumption is 142 pounds per person. This is higher than for any other nation. Insofar as children are concerned one has only to consider the large amount of candy, gum, soft drinks and other high carbohydrate confections they consume. It would also seem logical to assume that with the large sugar consumption, especially in between meals, that there would be sufficient dilution of the diet to decrease the intake of the more protective foods. It has been demonstrated that when excess fermentable sugars are consumed the lactobacillus acidophilous count in the mouth is high.[5, 6] The lactobacillus count in the mouth is used as an index as to the expected rate of dental caries.

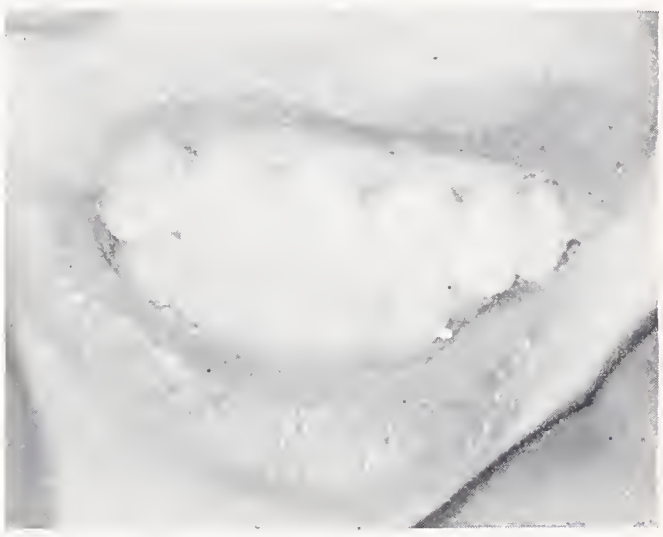


Fig. 2. A tragedy—a 4 year old child with a complete set of dentures which became necessary after the extraction of twenty teeth that were so abscessed and carious that repair was impossible.

It has been shown by Pincus[7] and Atkinson[8] that the bacteria which are increased in high carbohydrate diets act directly on the tooth glycoproteins, hydrolyzing them to form acids which decalcify the tooth.

It has been pointed out by Boyd[9] that dental caries can be controlled by diet but in his series all carbohydrates were given at mealtime and none in between meals.

Any form of malocclusion is bound to be of importance. It may produce poor mastication, irritation of the gums, abnormal retention of food, irregular eruption of the teeth and unstable emotional reactions. It may be caused by mild to severe congenital anomalies in the development of the teeth or jaws, absence of teeth, marked dental caries, thumb sucking and mouth breathing.

Calcification of the deciduous teeth begins at the fifth month of fetal life and ends at about the third year. For the permanent teeth it begins at about the third or fourth month after birth and is not completed until after the eighteenth year. The maternal diet then does not play too great a part

in the critical dental development which has been borne out by various studies. But the change from intra-uterine life to the neonatal period, the frequency and severity of infections during early infancy and childhood and the various deficiency diseases, such as rickets, scurvy, fibrocystic disease of the pancreas, celiac disease, may produce morphologic changes in the teeth, making them more susceptible to caries.

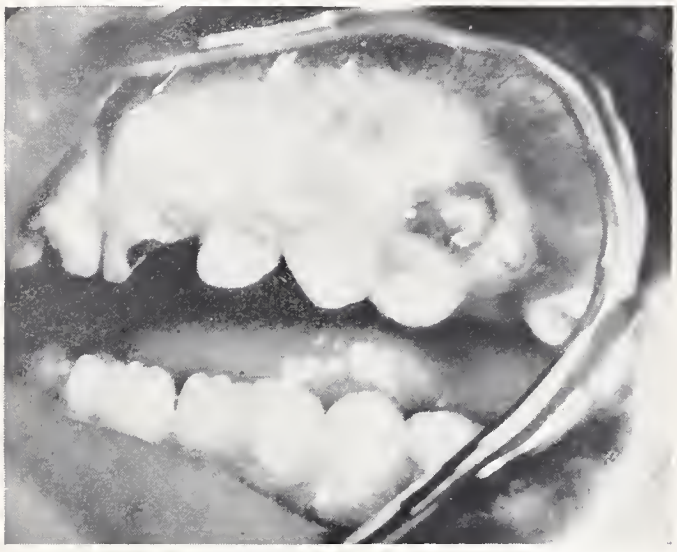


Fig. 3. Large gumboil, right upper gum, broken tooth and several large cavities on the left needing repair.

In experimental feeding of small animals, Sognnaes[10] reported that if the maternal diet was natural during the development of the offspring's teeth then dental caries did not develop in the offspring's teeth when fermentable sugars were added to their diet. But when the maternal diet contained sugars during pregnancy and lactation, then the offspring's teeth were caries susceptible when sugar was added to their diet.

The influence of heredity upon susceptibility to dental caries is not understood. Apparently, it is not an important factor. The endocrine glands also do not seem to affect the caries susceptibility although hypothyroidism may slow up the eruption pattern.

The protection of saliva may depend upon several factors. When it is present in large amounts it offers a natural washing of the teeth. It is normally alkaline and is highly buffered. The alkaline ash contained in many fresh fruits and green vegetables seems to increase this buffering power. The saliva of individuals who are nonsusceptible to dental caries has been shown to contain some protective substance. This may explain why one person has rampant dental caries and his next door neighbor does not.

Proper oral hygeine can influence the caries rate only insofar as retention of food between the teeth can be eliminated, the gums stimulated, the bacterial flora reduced, rinsing of sugar from the teeth, removal of bacterial plaques, cleansing the teeth and the development of good mouth hygeine.

Restorative dentistry also can help ameliorate the caries incidence by producing an awareness of dental caries. Correction of cavities already formed, as well as the correction of pits, fissures and malocclusions, is a part of good dental care.

METHODS OF CONTROL AND PREVENTION OF DENTAL CARIES

1. If one does not have dental caries or has a low rate, then prophylaxis and preventive methods are not necessary.

2. Education of the parent and child to the awareness and importance of oral health should be given early. It should have the same importance as other prophylactic therapy. If the parents are conscious of oral health they will accept the responsibility of teaching it to their children. Many good habits can be formed by the age of 5 to 6 years. To give accurate advice the physician should himself be familiar with the accepted methods of such care.

3. Children should be sent to the dentist for dental repair, prophylactic care and advice soon after the second birthday. This will instill confidence and reduce fear. They should be sent to an understanding and interested dentist. If the dentist realizes that he has the interest and help of the physician, much more cooperation will result. A report on referred patients by the dentist to the physician may create a greater interest in the child patient.

4. Restoration is the first step in caries control. The only sure way of treating a cavity is by restoration of the damaged structure. If complete, there is reasonable assurance that the lesion will not progress. This is the job of the dentist. Parents, physicians and dentists should be made to realize that deciduous or baby teeth require the same attention that permanent teeth require. When carious, they may produce pain, unhealthy gums, abnormal mastication, poor eating habits, apical abscesses, faulty eruption and, when lost prematurely, malocclusion. Every tooth has a place and function in the mouth. The baby teeth have the same function as the permanent teeth. They serve not only as grinding units but also as functional units to the proper development of the jaws and facial bones until the permanent teeth erupt in their proper place. Nature has provided an

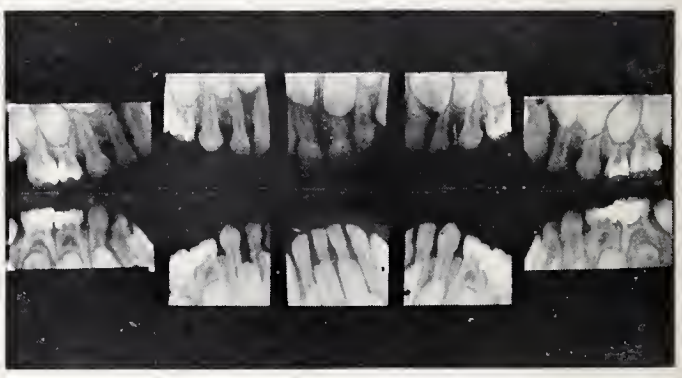


Fig. 4. X-ray of the teeth of a 4 year old child with nine large cavities needing repair.

eruptive pattern in that each erupting tooth is dependent upon its neighbor for its position. This is also influenced by the muscular pressure of the lips, cheeks and tongue. Premature loss of the teeth cripple the function of the mouth.

5. Nutrition. The role of vitamins and minerals has always been considered of importance in dental health. A well balanced diet with vitamins, minerals and sufficient rough food undoubtedly favors the development of good teeth. A large part of the necessary carbohydrates will thus be obtained without the necessity for a large sugar intake. Such a diet will not only lead to the development of good teeth but, just as important, will cut down on the high acid sugars and the bacterial products of food residue which come in contact with the teeth causing erosion of the tooth surface.

What influence the maternal diet has on the morphology and susceptibility of the child's teeth is not fully established but possibly it is not as important as was formerly thought.

6. Reduce the consumption of fermentable sugars, especially in between meals and at bedtime. Sugar provides carbohydrates and nothing else. Jams, jellies and marmalades have, in addition, only a small amount of protein. Milk, eggs, meat, cheese, fish, vegetables, fresh fruits, bread and potatoes provide not only carbohydrates but also protein, fat, calcium, phosphorous, iron, vitamins and acid or base. In contrast, consider the following sugars consumed in between meals by children: cola drinks and gingerale (6 ounce bottle), four and one-third teaspoonfuls sugar; 5 cent candy bar, seven teaspoonfuls sugar; chewing gum (1 stick), one-half teaspoonful sugar; one tablespoonful thick chocolate sauce, four and one-half teaspoonfuls sugar; one tablespoonful jam, jelly or marmalade, two and one-half to three teaspoonfuls sugar; one serving ice cream, five to six teaspoonfuls sugar; cookies and cakes (depending on amount and type), one to fifteen teaspoonfuls sugar. The other pops and frozen confections follow the same pattern.

7. Elimination of the giving of candy at end of appointments. This will make it easier for the family to reduce the number of sweets consumed by the child because they do not have to fight the example of the physician. Thick, syrupy, medicinal concoctions should not be used, especially for patients with long term hospitalization.

8. Brushing the teeth. The old dictum that a scrubbed tooth does not decay has sold many toothbrushes but has had little effect on the dental caries rate. Brushing the teeth morning and night has become a ritual; so much so, in fact, that the equally important brushing after meals is difficult to establish as a habit. Brushing the teeth has three functions—stimulation of the gums, removal of food particles from all tooth surfaces and cleansing. Recently, a fourth function has been suggested—the possible reduction or inhibition of acid-forming bacterial growth.

Brushing of the teeth should start before the eighteenth month of age. At that time usually a pleasurable habit can be started. It should be done after each feeding. A soft tooth brush and a pleasant tasting dentifrice, preferably a paste or watery solution, is best because there is less chance of harmful aspiration.

After the child has become accustomed to the tooth cleansing, the correct procedure for use of the tooth brush should be started. At first use a soft brush, small enough to fit the mouth. Later, a larger and stiffer brush should be used. The mouth is first rinsed thoroughly with water. Then, with the dentifrice, the bristles are placed firmly against the gingival dental margin and the brush rotated with a sweeping motion toward the occlusal surfaces. This will stimulate the gums as well as cleanse the buccal and interproximal surfaces because the bristles will be forced between the teeth. There should be five to six strokes over all areas until all the teeth have been included. Then a lateral motion on the occlusal surfaces will finish the job. The establishment of such a routine in early infancy should be attempted. Brushing at least after each meal and after the midmeal consumption of food or sweets, if possible, is recommended.

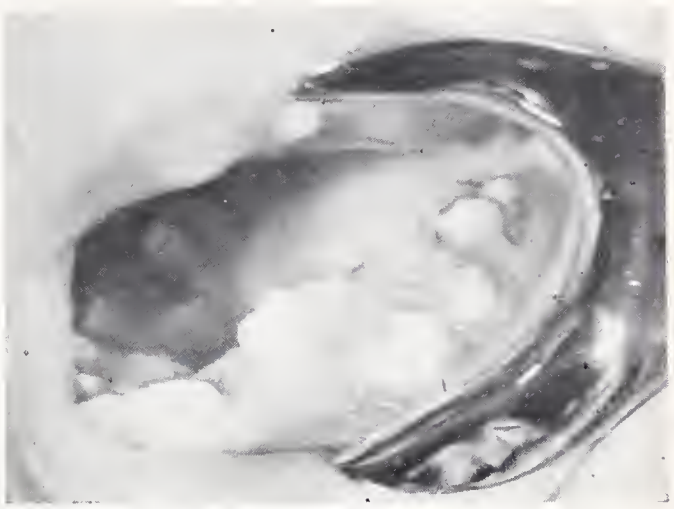


Fig. 5. Marked regularity of dental eruption due to abscessed and carious deciduous teeth.

9. Rinsing the mouth. As stated previously, fermentable sugars reduce the pH on the tooth surface from 7.0 to 5.0 within a few minutes after contact. During a meal, the increased amount of saliva and the intake of foods and fluids tend to dilute the substrate formed and aid in washing it away from the teeth. If brushing is not possible after the meal, rinsing the mouth with water is a good substitute.

Rinsing of the mouth with water after the taking of midmeal foods, confections and drinks will at least partially wash away the substrate and the sticky high sugar foods. This should help if the present theories of sugar and bacterial initiation of caries is valid.

10. Dentifrices. One is being bombarded with

advertising of dentifrices to which extravagant claims are being made. The big seller at the present time is one that contains the ammonium ion.

The ammonium ion dentifrice was developed by Kesel[11] and others at the University of Illinois Dental School. It contains 5 per cent dibasic ammonium phosphate and 3 per cent urea. The theory behind the use of such a preparation stems from the findings of an inhibitory substance in the saliva of caries resistant individuals.

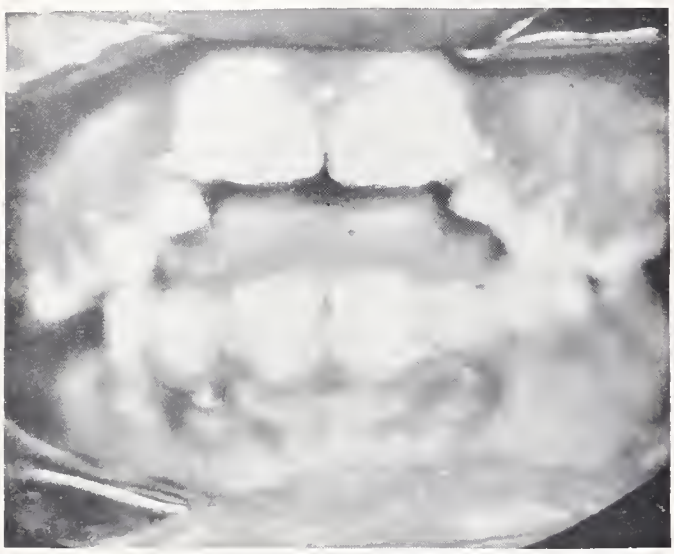


Fig. 6. Marked malocclusion caused by thumb sucking past the sixth year.

Ammonium ion dentrifices have been demonstrated to be effective in the reduction of oral bacteria but it has not as yet been sufficiently proven that they reduce the incidence of caries.

Reports on penicillin and chlorophyl dentifrices have not been sufficient to evaluate.

11. Fluorides. The systemic and topical application of fluorides is being used to prevent caries. They act by developing a surface enamel that is more resistant to dissolution by acid.

a. Systemic fluorides. It has been reported that the use of a soluble fluoride, 1.0 part per million, in public drinking water, will reduce the incidence of caries by as much as 60 per cent. To be of optimal value it must be used before the eighth year of age, during calcification and before the enamel is completely formed. Large scale testing of this procedure over a long enough period of observation should be available soon. When too much fluoride is available it may be toxic.

b. Local application. Topical application to the teeth of a 2 per cent solution of sodium fluoride has been reported to be of value in caries prevention. Some studies have shown as much as 40 per cent reduction in the caries rate. To be effective it must be done by a dentist after a thorough prophylaxis. The teeth must be thoroughly dried and the fluoride allowed to remain on for four minutes. Four such treatments are given in a two to three week period. It is recommended by the American Dental Association.

c. Fluorides in lozenges, tablets, wafers, dentifrices and milk, even if mixed with vitamin D and calcium, has been shown to be of no value. An insoluble calcium fluoride is formed which is not absorbed.

12. Added calcium and vitamin D are of no help if the diet and vitamin intake has been adequate.

13. Research is in progress for some substance that will interfere with the reduction of sugar to acids. This would be the most economic way to prevent caries initiation by fermentable sugars. One study has reported the use of vitamin K in this capacity.

14. It is important for the physician to know and recognize when children are getting acceptable dental care. This involves a knowledge of the basic principles of oral hygeine and the accepted theories of caries initiation. It will mean a mutual understanding of the problem of pediatric dentistry by both the physician and the dentist. They should be in accord in the modern and most up-to-date precepts of oral health.

15. There should be more education of physicians for a better understanding of the problems of oral health.

a. Medical students should receive some instruction in medical school on this subject.

b. More articles should appear in the general medical literature on the principles, new theories and advances being made in oral health.

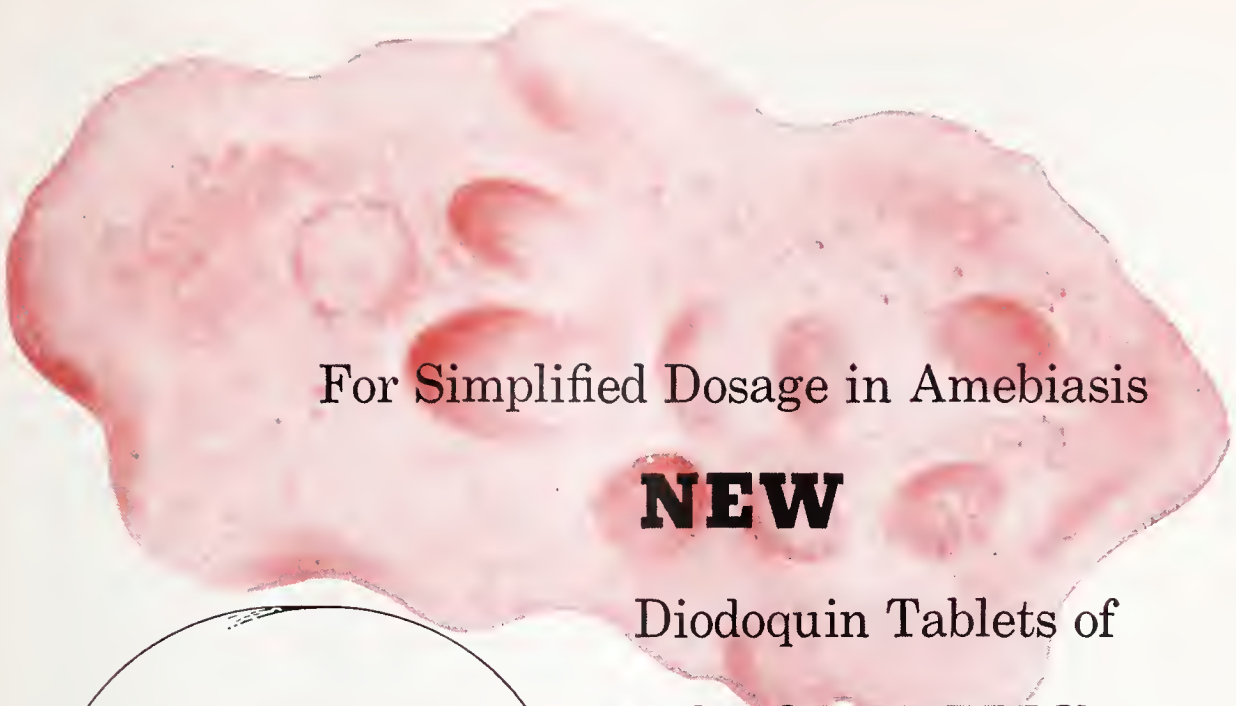
c. Dentists should be invited to participate in medical programs of the local hospitals and the county, state, national and special society meetings.

d. Some reading should be done by all physicians on oral health. The "Michigan Work Shop"[12] and "Sugar and Dental Caries"[13] can be recommended. Every doctor's library should contain a book on dentistry for children.

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Postgraduate Review

TREATMENT OF BURNS

THE GENERAL CONDITION, EARLY DEFINITIVE CARE OF THE LOCAL AREA, AND REPAIR OF THE SEQUELAE. A PLAN FOR CARE OF THE SURVIVORS OF AN ATOMIC ATTACK OR ANY MASS DISASTER

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THE TREATMENT of burns extends from the time a patient is burned until he returns to his former occupation, or is rehabilitated to the best advantage. Treatment can be divided into that of the general condition, the early local definitive care of the burned area, and late care necessary in the course of severe deep burns which includes the plastic surgery necessary for rehabilitation.

Earliest dressing in the services or in time of disaster for evacuation of burned patients to the place where they will receive the rest of their treatment may be found available in large gauze and cotton pads with accompanying ties and bandages, and are designed for application by nonprofessional workers. These large dressings are lined with fine mesh gauze and one of them will cover the trunk or thigh. They are said to be efficacious for from ten to fourteen days, but this time element is dependent on the type of burn received. Whereas this may be good treatment for mass casualties in central directed movement, it is not considered ideal for more than emergency coverage and, therefore, the following more tested and efficacious methods are described.

GENERAL CONDITION

The general condition is estimated carefully as soon as a burned patient is seen. If more than 10 per cent of the body is burned, even though superficially, shock is imminent. This is particularly true with infants and elderly people and, if there is debilitation, from other disease. Whole blood is used as soon as it is available, relying on substitutes as necessary. (A discussion as to what shock is, or the value of substitutes for blood, is not required here.) Isotonic saline solution and glucose or plasma can be used until the blood can be made available (with recognition of the relative safety of pooled and of individually separated plasma).

Dextran may be available generally and can be recommended for use by military and civilian channels as a blood substitute.

Salt may be found advocated as a dependent therapy and can be considered. Thirst is often excessive and, if possible, copious water may be given with one teaspoonful of salt and one of sodium bicarbonate to each quart.

The amount of blood to be given can be estimated by various methods, but nothing replaces carefully following the patient's general condition, including the pulse and blood pressure, hemoglobin, red blood count, volume of packed red blood cells and total protein with albumin globulin ratio. Hourly hemoglobin, pulse and blood pressure determination may be necessary during the first forty-eight hours in a severe burn. From a practical standpoint this is all that is usually necessary. If the hemoglobin drops to 10 grams, or the systolic pressure to 100, the patient needs more blood. There is concern by some as to the danger of hemo-concentration during this period. This can be decided by red blood counts and volume of packed red blood cells every four hours during this period and, if found to be present, corrected by using individually separated plasma or albumin. Even in this stage whole blood can be used.

The anemia which comes in from twenty-four to thirty-six hours in all severe burns is extremely important and its avoidance is a practical consideration. Maintenance of the general nutrition is most important and oftentimes difficult after the critical initial period is passed. An excess of vitamins and iron are supplied. The most essential is a full diet, high in protein and carbohydrate, given as many small feedings during the day, giving what the patient may want and trying to stimulate appetite with various foods, salty, sweet and sour; for example potato chips, salted peanuts and candy may be kept at the bedside.

Feeding tubes may be required and small ones with practically continuous drip of adequate diet are often of advantage. If the required proteins and necessary foods can be assimilated through the stomach, less intravenous feeding will be necessary. Repeated transfusions of whole blood will be necessary in an extensive burn until the open areas have healed or are covered with skin grafts.

Cortisone and ACTH are considered for use, but without conclusive evidence at the present as to their final value. Contrary to some reports, marked benefit to either the take or the survival of homografts is not universally established.

Antibiotics have decreased morbidity and mortality in burns and have lessened the time to prepare the open area for skin grafting in those with full thickness loss of skin. Penicillin and dihydrostreptromycin are used routinely. Aureomycin has been of considerable value also.

Extent of surface involvement is recorded as percentages, or marked on diagrams. Forecasts of survival based on the percentage of the body surface burned were popular and are interesting, but with intensive supportive therapy many patients with extensive burns survive.

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The degree or depth of the burn is another way of classification. A degree can be assigned to each layer of the epidermis, one to the derma, another to the subcutaneous tissue, to the bone, etc. This is unnecessary and impractical since of the total burned area the burn may be to the granulosa



Fig. 1. A. Painful acute superficial burn of face and neck twenty-four hours following injury. Superficial blistering, weeping, generally uncomfortable. B. Immediate healing, comfort and prevention of infection promoted by pressure, fine mesh, grease gauze dressing. Initial dressing left in place for six days. No other treatment necessary. Primary healing possible because this was a superficial burn. Comfort, promptness of healing, avoidance of infection, treatment as an outpatient made possible by dressing.

cell layer at one point and down and part way through the derma 2 millimeters away, and through the full thickness close by. Also, it is difficult for an experienced observer to tell in all areas of a burn whether the burn is through the full thickness of the skin or not. Practically a burn need only be classified as superficial or deep. A superficial burn will heal spontaneously from the intact deeper layers of skin. A deep burn heals from the edges if it is small enough or requires a skin graft for coverage.

Burns can further be classified as to the agent responsible for the damage. That is, there are thermal burns due to fire, hot water or flash; electrical burns; chemical burns; and burns resulting from irradiation.

EARLY LOCAL CARE OF THE BURNED AREA

The ideal treatment of the local burned area still seems to be the use of a fine mesh grease gauze pressure dressing. Fine mesh (44 mesh) is recommended to make dressings easier and less painful since this will not allow the granulation tissue to grow into the bandage as it will through coarse meshes and cause pain during the dressings (fig. 1). Also in the same way tiny islands of epithelium growing up onto the surface from the deep sweat glands and hair follicles are prevented from growing up into the bandage through the wide intertices of a coarse mesh where they would be pulled off with each change. Spontaneous healing is thereby encouraged by fine mesh gauze. A small amount of grease incorporated in the fine mesh gauze lessens the pain of changing a dressing by tending to prevent the bandage from "sticking." Petroleum jelly is sufficient but it may have added ingredients as 2 per cent boric, 4 per cent zeroform or 4 per cent scarlet red. Sterile dressings are supplied in sterile aluminum packages 3 by 18 and 3 by 36 inches, on 44 mesh gauze. Larger size on still heavier material may be available. An ideal pressure dressing can be secured by winding a gauze roll over a layer of inexpensive, clean, resilient, cotton mechanics waste, placed on the fine mesh grease gauze in contact with the open wound, and by its bulk immobilize the part. This can be known as a pressure-fixation bandage. On a fresh burn this type of dressing encourages healing by even pressure on the burned area. This cotton waste is obtainable in a desirable clean form as Surgical Waste, Walworth, Philadelphia. Crepe gauze rolls



Fig. 2. A & C. Circular full thickness loss of the skin of both legs resulting from deep burn when clothes caught on fire. Open areas prepared for grafting with frequent fine mesh (pressure) grease gauze dressings, done in the ward dressing room or operating room under sterile conditions. B & D. Appearance several months following coverage of open areas with thick split thickness grafts transferred from the back. Permanent repair in one operation.

may be obtained for elasticity, and a cheap one of crepe paper may be made available.

The time to change subsequent dressings is regulated by the necessity for maintaining the open wound as clean as possible. Daily dressings are often necessary. At each dressing the wound is cleansed gently with soap and water or detergent, and the necrotic tissue excised. This is done

under as sterile condition as possible, in the operating room if the burn is of any extent, and if necessary under general anesthesia. If there is any evidence of cellulitis the grease can be omitted from the fine mesh gauze and the otherwise same type of dressing wet with saline solution, weak Dakins solution, or 1 to 5,000 aqueous zephiran. This can be kept continually wet or allowed to dry out part of the time to prevent maceration. This is suggested as a "wet-to-dry" dressing.

Sterile air in the dressing or operating room as recommended by Colebrook is important but is not universally available, of course. General cleanliness in all care and disposal of dressings is highly advisable.

Doing nothing to the burn but leaving it open to the air is readvocated from time to time. No care is given to the area except to try to keep the coagulum intact as long as possible, and the patients are allowed up and about as they care to be. With antibiotics this method is a possibility more than formerly, but requires hospitalization for burns that could be treated as out-patients,



Fig. 3. A. Full thickness loss of skin over most of both thighs and buttocks following burn with gasoline. Taken care of elsewhere for several months. Appearance after several dressings consisting of washing with soap and water then applying fine mesh grease gauze pressure dressing. At this length of time following a burn these open areas become so painful that often a general anesthesia is necessary for adequate cleansing. B. Appearance one year following resurfacing of the open areas on the thighs with long, wide, thick, split thickness grafts cut from the back with the knife and suction box.

and tends to fall in the classification of being easiest for the attendents. This is at the opposite end of the careful sterile technic advocated by Colebrook, and has not been proven superior to the cleansing dressing method. The methods using coagulatants were also thought to be easiest, but often resulted in a much greater total amount of work because of infection and the loss of derma, changing superficial into full thickness losses.

Healing of superficial burns is usually complete in from ten to fourteen days. Deeper burns, but not extensive enough to require a graft, should be healed in a month. Spontaneous healing of the open area is from the edges and from the deep glands and hair follicles which grow up and spread over the surface. In the full thickness loss



Fig. 4. A. Contracture of axilla resulting from spontaneous healing of old deep burn. Part of natural healing tendency of an open wound is contraction of the edges which, when they occur in the neck or axilla or any such place, pulls that part toward the heavier side. Patient unable to fully abduct the arm. B. Twenty years later permanent restoration of function and improvement in appearance by one operation. This consisted of the release of the contracture and excision of the deep scar, resurfacing the open area with a free graft.

areas, the underlying fibrous tissue at the same time contracts the wounds, bringing the edges closer together. If this is over a large or important kenetic area there will be contraction, and destoration, and loss of function regardless of treatment unless the lost skin is replaced with skin grafts (fig. 2).

Early Grafting.—An extensive, deep burn should be ready to cover with a graft in from one to three weeks. Separation of the slough can be hastened by sharp excision during dressings under anesthesia, or done at the time of operation. Pyruvic acid and other solvents and enzymes have been used with some days shortening of the separation time reported.

Early excision and grafting of burns in the first two weeks has been advocated, but there are many qualifications of the procedure based on the ability to tell what is full thickness loss, and limited to flat surfaces. Certainly burns of the face, hands and feet should not have this method applied to them, until the depth is known. Immediate excision and grafting is so limited in application as to be inadvisable for advocacy. Certainly there has been no authoritative successful series of sufficient size.

Split skin grafts give the most satisfactory permanent coverage for most open areas. A split thickness graft contains from one-half to three-fourths of the thickness of the skin. Of this thickness there is an appreciable pad of derma, which makes the difference between the permanent healing of a grafted area and the unstable surface from spontaneous scar epithelium healing over a large area.

For cutting split grafts a method of flattening the skin surface is needed. Suction retractors

usually suffice using a long skin graft knife. Mechanical methods, as with the various forms of the dermatome, facilitate the taking of a split thickness graft from the chest wall and other areas not available with suction retractors (fig. 3).

Fixation of the graft is by sewing it around the edges, fixing it with a form or stent, or the graft



Fig. 5. A & C. Severe contracture of the neck following deep burn. B & D. Result possible by release of chin and excision of deep scar and chronically infected sinuses. Free, thick, split thickness graft used to cover defect at same operation, which has created normal neck angle and allowed for growth.

is laid over the open area and "snubbed" into place by carefully rolling fine mesh grease gauze and the dressing itself. The time for changing the dressing on the area grafted is regulated by the condition of the wound on which it was placed. It is usually done from five to eight days postoperatively.

The donor site is dressed with fine mesh grease gauze, held securely with adhesive, and pads are put over this for good firm fixation. It is removed on the tenth to the fourteenth postoperative day, at which time the donor site is usually healed and requires no more dressing.

Small-deep, or "pinch grafts," have only limited use; usually in desperate patients. Full thickness skin grafts are used in specialized areas as the fingers or kinetic areas as on the face and eyelids in later repairs.

Homografts do not persist permanently except in the case of identical twins, but used as an emergency "dressing" in severe burns may prove to be life saving. The grafts may be obtained from fresh autopsies as well as individual donors. Theoretically close kin should be best but blood grouping is of no demonstrable value. They are used most often in children with extensive, full thickness, loss of skin, or in other extremely debilitated patients to tide them over until they can stand the transference of their own skin. There is, so far, no conclusive evidence that these grafts are affected by cortisone or ACTH in enough degree to make much difference.

Skin banks and frozen skin banks may have good usage, but so far they are not universally applicable and the source of immediate autopsy skin may be counted on in most large centers if there are not individual donors available (fig. 4).

The late treatment of burns is mainly the plastic surgery concerned in the repair of contractures and distortions which have resulted from healing of full thickness loss of skin treatment of burns of specialized areas as the hands, face, eyelids and defects of the nose, and other features that



Fig. 6. A & B. Contracting deep burn scar of neck which has pulled the chin down to completely obliterate the neck angle. Previous operations done elsewhere with attempted release of pull and coverage of defect with "pinch grafts." C & D. Result of one operation consisting of complete excision of deep scar down to normal scar free base. This allowed chin to come up to normal position, leaving the anterior and lateral part of the neck and the anterior surface of the chest open, which were covered by a thick, split thickness graft. Normal neck angle.

require complete reconstruction rather than just flat surface grafting.

CONTRACTURES

In the repair of late burn contractures, free skin grafts can be used extensively and will give permanent bearing surfaces in many instances. They often may be substituted for the tedious use of

pedicle flaps which would require multiple operations.

If any considerable amount of raw surface is present with the contracture, it may be advisable to cover this at the first operation and to relieve the deformity subsequently (fig. 5).

When there are sinuses extending down into scar folds that harbor organisms detrimental to the chance of "take" of a skin graft, it may be advisable to do a preliminary opening and excision, followed by a short period of wet dressings, and subsequent skin grafting.

In repairing healed contractures, all possible surrounding skin is, of course, utilized and any webs present may also be fashioned into local flaps (Z-plastics) and used. If the contracture is marked and complete relief is to be obtained, there usually will be a considerable amount of raw surface to be skin grafted even after all available local tissue is utilized. This grafting is usually done at the same operation (fig 6).



Fig. 7. A & C. Thick scar of neck and absence of ear resulting from deep burn. B & D. Restoration of neck angle by excision of scar from "ear to ear" and from chin to clavicles. Defect covered by free split thickness graft in one operation. Reconstruction of ear.

In opening contractures, caution is advisable as important structures may have been pulled out into the scar. Care is taken to avoid severing any important vessels or nerves and exposing tendons, joints or bones. If the scar is broad and dense without any appreciable webbing, it may be best first to excise the superficial layers of it. The deeper portions then can be dealt with by gradual decortication (removing it in thin layers), or by opening transversely across it at many different points, or by a combination of these. Constant but light traction is made during the process and various tight points in the deep scar can be palpated and opened as they appear. Any strong or sudden jerking movements, however, may cause undesirable exposure of deeper structures (fig. 7).



Fig. 8. A & C. Deformity resulting from the spontaneous healing of a deep burn of the neck. Chief complaint was of lack of a "water tight mouth" in spite of uncomfortable position of head. B & D. Immediate result of only operation with restoration of normal neck angle, water-tight mouth, and apparent change in whole personality. Smoothing out of edges of graft will be done later.

Darts opened into the surrounding normal skin may be necessary if the contracture is of such long-standing that the adjacent skin has not expanded normally. The opening usually should be continued until complete release of the contracture is obtained, e.g., in an axilla so that the arm can be extended upward until it touches the head, and in the neck until the head can be extended backward. The raw surface remaining for grafting usually consists of short strands of scar and fat. If part of an important structure such as nerve, vessel or tendon is exposed, the dissection is stopped at that point and a small local flap of fat sutured over it. The dissection is then resumed in other places. Muscles may be exposed during the process, but it is best not to cut into them even if some deformity is left. Instead the greatest possible

release is obtained and at a later date further opening and grafting is done (fig. 8).

Bow-stringing of vessels and nerves across the contracture is an uncommon but most troublesome complication. It is most apt to occur in old contractures about the elbow or knee. Everything else in the area is made as free as possible and the surface is then covered with grafts. Either splinting or light traction is utilized to maintain the degree of opening and after three or four weeks, when the grafts are stable, either extra traction or exercises can be used to help stretch them. Secondary opening and grafting after this may be necessary. At times, it may be best not to do the grafting primarily but to use traction and moist dressings for a few days after the opening and then graft.



Fig. 9. A. Deep burn of lower lids which in healing has pulled them away from contact with the globes. Exposure invites corneal ulceration in addition to constant extreme subjective symptoms of irritation. Adequate coverage of the eye in such instances demands almost emergency care. B. Full thickness grafts were set in the lower lids, after the deep contracting scar was excised. Both sides were done in one operation.

Bony dislocations may occur in severe contractures of long duration, but usually can be reduced, after the soft tissues are opened, without special equipment or great difficulty. Secondary shortening of tendons and joint capsules can be quite troublesome about the hand. This is discussed under repairs of that region.

Physical therapy and directed exercises may be quite helpful in regaining function when the grafts are stable.

SPECIALIZED AREA

Distortion or loss of a feature is one of the most difficult problems of repair with which plastic surgery must deal, such as loss of the ala border or columella of the nose. Formerly this involved the long drawn out procedure of raising a distant flap and its transfer to the nose, in a number of operations, and resulted in a thick repair.

Free composite grafts from the ear, consisting of two surfaces of skin with cartilage between now can be considered for the replacement of losses of these areas of the nostril border and tip and columella. These defects can be corrected in one procedure and the resulting appearance is best of any method used; there is minimal deformity of the donor site and the use of bulk flaps is avoided. The ear can be repaired with a local flap, or by burying the open ear under a direct scalp flap from behind and freeing it and grafting the defect two to three weeks later. These were reported from use at Valley Forge Hospital in World War II (fig. 9).

Full-thickness grafts from the neck and the clavicular region have been found to give superior results in the repair of facial defects as to color match and function. The amount of skin available is limited, but there is enough for eyelids, the nose and about the mouth. Two main advantages are improved function and color. The grafts were first used on the lid, and many full replacements of the lid skin can be barely distinguished. The color is close to that of the normal face and is due to the good color of the neck skin, plus the good function that is possible (see fig. 9). None of these grafts so far have needed pigment injection for color matching, whereas the dead whiteness or darkness of other grafts often leaves much to be desired. There is natural redness in these grafts not found in other skin, which accounts for the match with the surrounding skin. (On a burned face that has healed to a dead white, these grafts give a noticeable contrast, although they are the closest to normal).

The second advantage is softness and, therefore, function. This function, of course, is of underlying muscles, but these grafts heal in so soft and have such thickness that the best kinesis of grafted areas can develop. This property again is best expressed in eyelid repairs, where hard, board-like scars of gasoline and phosphorus burns have to be literally dug out of the lids and across from one eye to the other over the nose. When these areas are covered with the neck grafts, there is often a dramatic relief of scar fixation and return of softness and function. The good function is due to the thickness and return of softness and possibly because of the character of the skin which, in its natural habitat, overlies a platysmal muscle. This point has not been proven so far, but the result of an eyelid's being soft, or normal color, giving normal function, healed in, with practically no edge scar, in two to three weeks after grafting, brings up the platysmal idea. Late function is excellent as there is minimal contraction of the graft bed when these grafts are used.

HANDS

In burns of the hands, every effort should be put forth to prevent deep infection which will rapidly fix tendons and joints and produce deformities that may never be overcome. It is particularly essential to get all areas of full thickness loss clean and covered with grafts as soon as possible. There seems to be unanimity of opinion that dressings with open surgical drainage is the method of choice in the initial treatment, that fingers should be dressed apart, and the whole hand kept in the position of function.

Certainly early excision and grafting of hand burns is not indicated. But the earliest possible grafting should be done. Most burned hands can

be grafted in from one to three weeks. There is less agreement concerning the respective merits of early motion and immobilization, but perhaps most will agree that active movements of the fingers should not be delayed, especially in adults. Active movements in soapy water at the time of each dressing are encouraged on our service as giving the best results. Others, however, in World War II, wrapped burned hands in gauze, incorporated them in plaster of paris casts to above the elbows and then suspended them above the patient. Reports indicate good results with the chief effects being those of immobilization and minimum swelling. Comparisons of these two methods are still made with the answer possibly being a conservative adaptation of both elements on an individual patient requirement. As is often the case, one method (the cast method) promises less work for the attendents at the immediate time. But whether the total amount of work in prolonged rehabilitation might not offset this questionable early gain should be considered.

As a rule, burns of the dorsum are more crippling than those of the palm because of the close approximation of the extensor tendons to the skin surface and to the interphalangeal and metacarpophalangeal joints and capsules. The midportion of the extensor tendon frequently is destroyed over the middle finger joint, the lateral slips of the tendon being left. In action, the effort of the extensor sleeve flexes the finger when the patient tries to extend it.

If the patient is critically burned elsewhere, there may be an unfortunate tendency to neglect the hand and it may never recover it full function.

Most full thickness skin losses of the hand can be made clean enough for grafting in from one to three weeks. At that time, after careful removal of the granulations, the defect may be covered with thick split grafts. In many instances, this original covering will suffice for complete and permanent healing. In any case, it produces healing and prevents continued infection and, if it does not permit good enough function, a more suitable repair can be made later with more split grafts, a full-thickness graft or a pedicle flap.

Late healed deformities of either surface of the hand require extremely careful dissection of the scar to allow complete release without exposing tendons. This means that forced manipulations should be done only with graft caution to prevent sudden exposure of a wide area of tendon. It usually will be found that the scar can be freed gradually by excision and partial incision through it to allow normal replacement of the parts even though a light film of scar tissue is left on the tendons. At that time, if it is found that no tendons or only small areas are exposed, a thick split graft or possibly a full-thickness graft can be used. Some means of fixation should be arranged that can be maintained for three weeks, such as wire screening. The hand usually is retained on the splint from from two to three weeks and then active motion is begun, with replacement of the splint at night if desirable. Children usually need no physical therapy, beyond what they will work out for themselves in activities, but older patients do.

Burned tendons and bones may be slow to separate but should not unduly delay the grafting. A preliminary debriding operation can be done, or definitely dead portions removed at the time of grafting. Conservatism is worthwhile as the cortex on one side of a phalanx may separate, and later healing may leave a functioning bone.

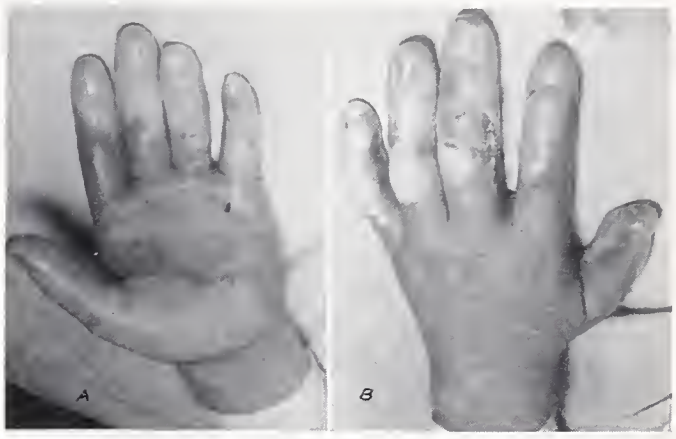


Fig. 10. A & B. Acute radiation burn of the hand following overexposure to fluoroscope. Blistering and deep slough. Intense pain required 3 to 5 grains of morphine a day. Received general supportive treatment and conservative management of local areas. Resection of involved skin as it definitely declared itself, with immediate coverage by free split thickness grafts. Amputation avoided.

Tendon and joint contractures may prevent complete release of a deformity, but can be opened as far as possible and grafted, and traction or occasionally tendon-lengthenings used later, followed by more grafting.

Partial restoration of function is the best that can be hoped for in some severe injuries, but is well worthwhile. Many deformities could be prevented by adopting the view that the lost skin should be replaced early, and no excuse can be found for the completely webbed, or degloved hand, as it has been called. Permanent function of free grafts on hands has been quite good. However, the anatomy of the skin and subcutaneous fat in the palm differs considerably from that of the rest of the body, and such repairs are regarded as useable substitutions rather than true restorations.

Pedicle flaps must be considered when too much viable tendon is exposed, or when tendons are lost and replacement is being contemplated, though free grafts can be used temporarily for healing in the latter case. The usual flap is a direct one from the abdominal wall.

Physiotherapy has a definite place in the rehabilitation of burned patients. Extremities splinted until healed or until a skin graft is solid require restoration to function. The aim in the early resurfacing of a burned part is the return as soon as possible to useful function. This results in less deep scar than if spontaneous healing is waited for. Most patients so grafted require only limited physiotherapy. It is started as soon as possible

after a rapid surgical restoration. Active motion in a pan of warm soapy water is usually all that is necessary, and the usual eager patient can carry on on his own at an early date. The rapid restoration of function of a child is a good demonstration of this possibility. Badly fixed hands, of course, require long continued work in physiotherapy.



Fig. 11. A & C. Acute irradiation burn from cyclotron. Redness, pain and blistering following exposure to cyclotron. Received conservative treatment to involved part with at least temporary avoidance of operation. B & D. Hand healed but result of even mild trauma to irradiated tissue seen at end of index finger. Open ulcer which looked as though it would require shortening of the finger. Again conservative care encouraged complete healing. Patient being seen at intervals with plan to excise definite, declared, involvement before breakdown.

At a later date it is important to recognize how much disability is in the joints rather than overlying scar as forced manipulation may make this worse instead of better.

Occupational therapy may give the correct fine or gross exercises to loosen joints and tendons and moreover to encourage the patient to go ahead with his efforts in an otherwise hopeless appearing situation.

ATOMIC DISASTER AND MILITARY BURNS

In atomic disaster many burns are to be expected, and the same is true for other types of bombing. As to the immediate radiation effect locally it probably cannot be recognized and specific care is not directed toward it except it can be remembered that any one with heavy radiation exposure will not resist or recover from other mechanical injury as well as one who has not received the radiation effect. Obviously, constant personal care by highly trained personnel would not be possible, though none the less desirable, in case of atomic attack on troops or civilians, or in any mass disaster. The following outline is suggested as being in line with a central directed plan for taking care of large numbers of burned patients. It is emphasized that thermal burns will be present following an atomic attack, and whatever the agent the immediate treatment for the burns is the same (fig. 10).

As to general supportive therapy for the severely burned, whole blood should be given as previously outlined or individually separated plasma. Since this will be exhausted quickly in the affected area, substitutes including dextran can be given. In general, burns covering up to 15 per cent of the body surface will not need parenteral fluids. They will supply themselves sufficient fluids by satisfying their natural thirst. Whole blood is especially needed for radiation exposure.

Saline treatment may be found recommended and a satisfactory saline solution that can easily be made available is one teaspoonful salt and one teaspoonful soda bicarbonate in a quart of water. This can be given in large quantities and stopped if nausea develops.

The introduction of antibiotics has made the treatment of burns different, as was previously stated. Because of this, all patients, particularly the severely burned, should receive penicillin, streptomycin, aureomycin or chloromycetin, whichever is available, using 300,000 units of penicillin as a base recommendation. ACTH or Cortisone thus far have not been proven adequately on the treatment of burns for final positive recommendation of usage (fig. 11).



Fig. 12. Chronic irradiation burn of the hand. A. All the signs of chronic irradiation present with telangiectasis, "coal spots," atrophy, keratosis, ulceration and carcinoma. Due to repeated exposure to x-ray in a physician, incurred while taking care of others. B. Entire back of the hand and fingers excised and open area covered with split thickness graft. One operation. Normal function. Progression to carcinoma in an irradiation burn assured if the patient lives long enough.

As to immediate care of the local burned area for evacuation two large pads may be found provided, called a "blanket type dressing." These pads will be large enough for the trunk or thigh and consist of absorbent cotton on one surface of which will be fine mesh gauze. It is intended that they can be applied to the burn surface by an orderly or anyone in attendance.

There is a question as to whether fine mesh petroleum jelly gauze will be inducted to prevent

the dressing from sticking. Fine mesh vascline gauze is now supplied by the Vaseline Company in sterile aluminum packages and is available in the army table of supply. It is thought that a small amount of grease in the fine mesh gauze is superior to dry fine mesh, and if possible it can be applied first (fig. 12).

These first dressings can remain in place for fourteen days, under some conditions; in others it is highly desirable that changes be made before what would be second degree burns are changed by infection to third degree losses.

Mention is made again of the open (or no local care) treatment of burns. Its adoption at a time of widespread disaster with a large number of burns would require the hospitalization of all burned, thereby possibly filling all available beds in a short time. On the other hand, using a fine mesh, pressure, grease gauze dressing would allow the greater part of the less extensive burn cases to be taken care of at home. The limited number of hospital beds in any stricken area is going to require that much treatment be given to burned people as outpatients (fig. 13).

Atomic irradiation burns, because of possible imminence, are mentioned. The most important thing to understand in their treatment is that in the acute burn the treatment should differ little from that given any severe burn. At the time of the disaster this burn will not be recognized as



Fig. 13. A. Chronic irradiation burn of a dentist's fingers. Same signs as in fig. 12, but had not yet proceeded to carcinoma. Involved area excised and immediately covered with free graft. One Operation. Normal function. Amputation avoided.

such but will probably have a thermal burn along with it. They will need the same supportive therapy and care to the local areas; that is, fine mesh grease gauze pressure dressings. It has been found from personal experience in the treatment of local burns due to atomic irradiation of heavy dosage in a localized area that these burns differ from other irradiation burns in that local symptoms may begin soon after exposure, and that they progress to the chronic phase more rapidly, this being due to a heavier dose than is seen otherwise. Redness is observed in a few hours, blistering in from four to six days. This blistering usually runs its course in about thirty days, and there is either healing or sloughing, with resultant open wounds according to the degree of exposure. Relief of pain, prevention of infection and general supportive measures are the main items of treatment. Blood changes have not been significant in patients with exposure to small areas. The later treatment consists of resurfacing of the open areas, or conservative excision of individual parts as they begin to show the effects of chronic irradiation and coverage with free grafts (fig. 14).

It is reemphasized that patients with whole body

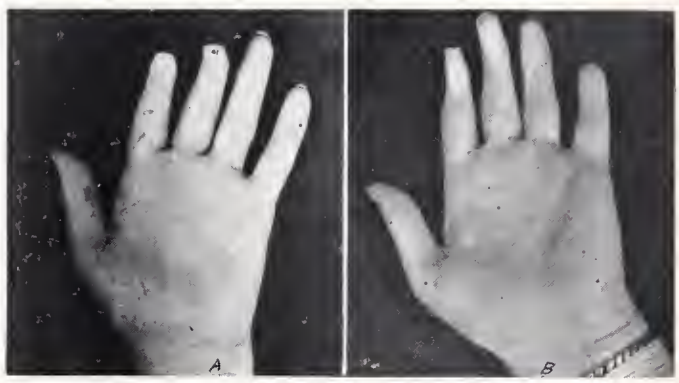


Fig. 14. Atomic burn of hand. A. Rapid progression to signs of chronic irradiation burn with atrophy, telangiectasis, "coal spots" ulceration with suspected ultimate end in carcinoma characteristic of atomic burn. B. Possibilities of function following conservative excision of involved skin and immediate resurfacing with split thickness grafts.

radiation do not withstand other mechanical trauma as well as without radiation, and that whole blood will be needed for these patients more than for those who have been hurt or burned but without radiation.

SUMMARY

Note as what is thought to be the best treatment of burns has been given; supportive therapy with adequate supply of whole blood, antibiotics and adequate diet in a hospital, with fine mesh grease gauze, mechanics waste, pressure dressings, done as often as necessary, under anesthesia, for rapid preparation for skin grafting when there has been full thickness loss of skin in any type burn. Possible first aid for treatment of burns on a disaster scale and military is outlined including those burns of atomic origin.

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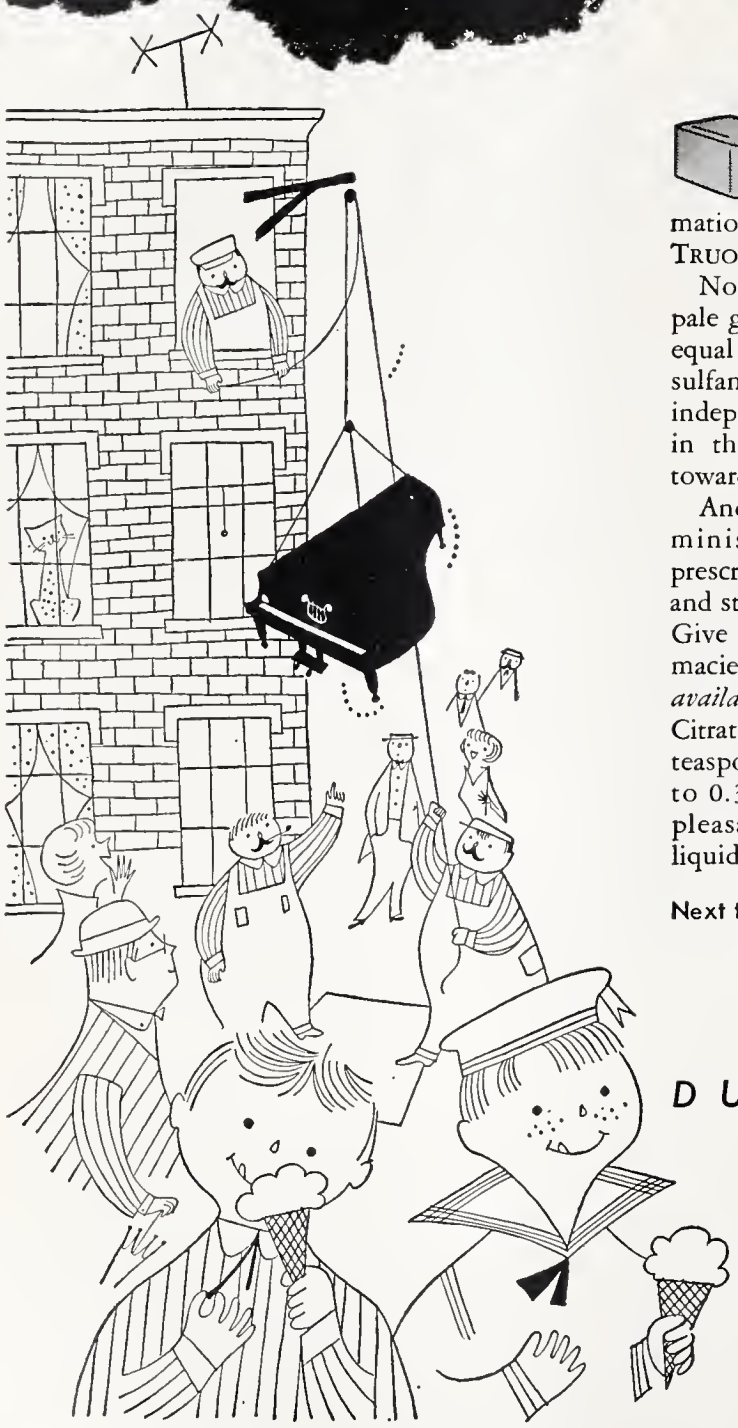
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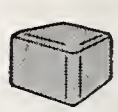
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This 37 year old white male entered the hospital on October 24, 1949 and died on January 1, 1950.

Chief Complaint.—Pain in the right hip.

Present Illness.—Twelve years previously the patient developed nervousness, diabetes, polyuria, polydipsia, polyphagia and lost weight, from 194 to 137 pounds in eight months. He was hospitalized for three weeks, placed on a diet and given insulin. He failed to gain weight. Six years ago he had diarrhea and was hospitalized again. At that time he had diarrhea with acidosis. Following that, he felt well in spite of glycosuria.

Two years ago he began to have swelling of the legs. Three and a half weeks before the present admission, gradual onset of pain in the right thigh on the lateral side a few inches below the trochanter was noticed. It was deep and boring in nature and was aggravated by motion. He sustained a deep burn with ulceration from a heating pad.

Past History.—History during the last year and a half was of difficulty in walking and keeping balance, numbness in the lower extremities and inflicting of injuries in the lower extremities without being aware of it; progressive weakness during the last two years; diarrhea (six to twelve watery stools a day at times). He had been taking insulin, 10 units, before breakfast and supper.

Physical Examination.—Blood pressure was 186/110, pulse 100, temperature 101 F. He was undernourished and weak. The tongue was beefy red and smooth and cheilosis was present. Fundi were normal. Heart, lungs and abdomen showed nothing unusual. Over the lateral aspect of the right hip there was an 8 cm. area of necrosis and there was a 3 plus pitting edema of the lower extremities. Neurologic examination revealed diminished modalities to pin prick, cotton, vibration. All reflexes were absent except the triceps reflex.

Laboratory Data.—Red blood cells were 4,080,000; hemoglobin 10.3 gm; white blood cells 14,000 per cm.; differential showed moderate shift to the left. The urine showed a persistent 2 plus albumin, sugar 5 per cent, normal microscopically; phenolsulfonphthalein test at 1 hour was 11 per cent, at 2 hours 25 per cent, 36 per cent total. Fasting blood sugar was 377. Nonprotein nitrogen was 33, diastase 20, cholesterol 152, total proteins 5.4, albumin 2.4, globulin 3.0, albumin-globulin 0.8, serum chlorides 545 mg. per cent, phosphorus 3.6, urea clearance 35 per cent. Esbach test showed 1 gram of protein in urine per twenty-four hours. Lumbar puncture gave normal findings except for protein of 60 mg. per cent. Stool cultures for ova and parasites were negative. Proctoscopic examination showed mild proctitis. Typhoid and paratyphoid agglutination tests were negative. Quantitative fat determination of stool was within normal limits.

Gastrointestinal x-ray series showed abnormal fragmentation and flocculation of small intestinal pattern consistent with a nutritional deficiency. Chest plate was normal. Electrocardiogram was normal. A culture of the lesion over the hip showed B. coli and later B. pyocyaneus. Bone marrow was normal. The urine on November 15 showed many yeast cells. Cystometrogram later revealed an atonic bladder.

Course in Hospital.—The patient was placed on a high caloric, high protein diet and was given large amounts of vitamin supplements as well as folic acid, crude liver and vitamin B_{12}. Penicillin and streptomycin were given for fever, presumably on the basis of the lesion on the right hip. Diabetes was fairly well controlled on insulin. Surgical exploration of the right hip showed an extensive undermined lesion which was debrided and drained. During the hospital stay this lesion improved but never healed entirely. Blood transfusions were given as necessary for recurring normocytic anemia. The patient had a low grade fever during the entire hospital stay. After five weeks' treatment the patient showed definite improvement. Diarrhea had ceased, his appetite had improved, cheilosis and smooth tongue were much improved and there was considerable improvement in the neurologic picture as well as disappearance of the edema.

A few weeks after admission, a retention catheter was inserted because of difficulty in collecting fractional urines, the patient having inability to void due to a neurogenic bladder. Catheter was removed two weeks later when residual urine was negligible and he could void without difficulty. On November 15 the urine showed many yeast cells.

On December 5, the patient complained of passing gas and white frothy urine per urethra. Urine at this time was "loaded" with white blood cells and yeast cells and the test for carbon dioxide was positive. Urine culture showed B. coli. In the following weeks therapy consisted of abolishing glycosuria entirely by insulin, acidification or alkalinization of the urine, chloromycetin, aureomycin, methylene blue, potassium iodine and instillations of gentian violet into the bladder, the latter being discontinued because of intense discomfort. Urine was "loaded" with yeast cells and white blood cells up to the time of death.

On December 14, nonprotein nitrogen was 40. Right costovertebral tenderness had appeared. At that time the patient appeared weaker and his appetite was diminishing. By the next day edema had accumulated significantly and the eyes had

become puffy. Nonprotein nitrogen continued to rise to 90; CO_2 was 67 volume per cent; serum chloride was 560 mg. per cent.

On December 26, the patient developed increase of mild tachycardia which was present for a few days, edema increased, rales appeared in the lungs and the heart developed a tictac rhythm. Chest plate at that time showed bilateral congestive changes and hydrothorax. Circulation time was 20 seconds, arm to tongue. The patient was digitalized with no apparent effect. The electrocardiogram on December 27 showed right axis deviation, sinus acceleration and myocardial damage. On January 1, the patient expired suddenly.

DISCUSSION

Ralph A. Kinsella, M.D.: This man apparently had diabetes for at least twelve years for at that time some of the symptoms of diabetes, such as thirst, polyuria and increased appetite, appeared. He lost a great deal of weight. Whether this was due to treatment or not is not clear. A person who is fat and becomes diabetic may lose a tremendous amount of weight because of the general disturbance of his nutritional status associated with the inability to handle carbohydrate. Obesity alone may bring a patient into a state of relative insulin insufficiency and the removal of the obesity may correct this. This patient's diabetes was apparently never under good control. Later certain evidence developed which points to involvement of the vascular tree. He had, for example, hypertension. He had difficulty in walking and he had numbness of the lower extremities. He also had anesthesis of the skin of the lower extremities as well as numbness and the difficulty in maintaining his balance which may have been more due to sensory nerve disturbances than to vascular disease. Vascular disturbances in the lower extremities or in the feet are usually much more focal than this and not so generally bilateral.

He came into the hospital apparently in a remarkable state of undernutrition and had a marked avitaminosis. He had a diarrhea which might have been a kind of nontropical sprue; diarrhea due to steatorrheas are also not uncommon late in diabetes. There are apparently two similar diarrheas of different origin. The evidence here points to definite limitation of renal and liver function. He had had a nonprotein nitrogen that started out at 33 and went to 40 and higher. The urea clearance is 35 per cent of normal and his dye excretion is only 36 per cent in two hours which is definitely low, not alarmingly low but definitely low.

This patient was treated for his diabetes and the ulcerated necrotic area on the right hip. This is high for an ulcer due to a general nutritional deficiency. It is more suggestive of a decubitus ulcer. He had fever for which penicillin and streptomycin were given. (I might pay my respects to streptomycin. There is really no great need for this material. Its area of usefulness is limited yet it is used almost indiscriminately, especially in genito-urinary infections. It is probably the least valuable of all drugs in this field because its effectiveness changes so rapidly from day to day. The minimal effective dose of streptomycin against B. coli, for example, is about double on the second day of what it was on the first. It is of little value when one considers that there are other agents such as aureomycin and chloromycetin which are highly effective and do not have such a fickle minimum effective dose. The deafness that follows the use of streptomycin, the ordinary one or the dihydrostreptomycin, is constant enough to make it a troublesome drug to use.)

This patient was treated for a fever which was the result of an infection of the ulcer on the right hip. Then a peculiar thing happened; he began passing gas from the urethra and the urine at that time was loaded with yeast cells. The passing of gas by urethra is a surprising phenomenon and it may occur when there are not any yeast cells in the urine and may indicate a connection between the bowel and the bladder as there not infrequently is in perforating diverticulitis of the colon so that the gas may then escape with the urine or without the urine through the urethra. In this case while the yeast is emphasized as a possible source of gas, nevertheless, it is worth while thinking about and investigating further to make sure that the bowel is not the source of this gas. Now comes the question of the occurrence of extensive vascular involvement in diabetes, particularly of the kidney. The condition does not particularly merit a man's name as being attached to it although the name of Kimmelstiehl and Wilson have been attached to the combination of diabetes, vascular disease and renal insufficiency. Usually there are retinal changes but they were not reported in this case. There are several questions which occur to me. One is the possible relation of the ulcer over the hip to the infection which the patient had, particularly as to whether or not this might have been the portal of entry for the yeast. The patient had no evidence of a meningitis and it is not known what type of yeast was present. The neurologic lesion which produced the numbness of both legs is of some interest. For the last year and a half he had had difficulty in walking and maintaining his balance. He had had numbness of the lower extremities with so much anesthesia that injuries to the lower extremities could take place without his being aware of them.

Nothing is said, however, about motor weakness, so that such a thing as a transverse myelitis cannot well be supported by this description. I should think the things of interest would be the association of diabetes with the vascular disease and renal disease, the question of the culture and the type of infection that he had and the question of the neurologic lesions.

R. O. Muether, M.D.: I would like to point out that this man had a low diastase and it occasionally happens that a lesion that destroys the pan-

creas and produces fibrosis can lead to diabetes although that is not particularly frequent. Fibrosis of the pancreas could also cause diarrhea without an increase in the amount of fat in the stool. One often talks about steatorrhea as though it is a necessary component of chronic pancreatitis but, of course, it is not.

The renal lesion strikes me as being one which must be somewhat peculiar because despite the fact that he had a limited output of phenolsulfonphthalein and despite the fact that he obviously had renal damage, he does not seem to have many red cells in his urine, he does not have much albumin in his urine and he maintained a good albumin-globulin ratio and a fair total protein, so that some of the things which one would ordinarily consider cannot be considered in this case; for example, nephrosis, diabetic or otherwise, glomerulonephritis and nephrosclerosis.

Intracapillary glomerulosclerosis or Kimmelstiehl-Wilson's disease is customarily thought to occur most frequently in patients who have relatively mild diabetes rather than in those with severe diabetes as this patient apparently had and one must go back to the infection which he had, particularly the infection in his bladder. Such an infection could lead to a pyelonephritis which could cause hypertension and the other symptoms. The fungus infection of the bladder and the kidney, if the kidney is involved, is rather unusual and I imagine that the constant glycosuria which this individual had, would be important in such an infection. I feel that this patient had some unusual type of kidney disease, possibly in the nature of a pyelonephritis.

G. O. Broun, M.D.: I might say a word about the neurologic symptoms. The blood picture shown here does not bear out a diagnosis of pernicious anemia and therefore the cord symptoms which are similar to those that occur in pernicious anemia probably are not due to that condition. Some of the findings may be the effects of malnutrition. It also should be pointed out that there are such things as a diabetic neuritis and diabetic pseudotabes and it seems to me that these symptoms do fit rather well a diabetic pseudotabes. Just exactly how the diabetes affects the nervous system to produce these lesions is not too clear but one must remember that the central nervous system is dependent upon a healthy carbohydrate metabolism for most of its energy and that probably in the disturbance that occurs in carbohydrate metabolism in diabetes, there is a tendency to damage of the nervous system and particularly when aggravated by a dietary deficiency.

It is interesting to speculate whether the yeast in the urine and the existing ulcer on the thigh had any connection. The failure of the case to terminate with meningitis is against a diagnosis of torula although torulosis can be a generalized infection. I do not believe this is a case of histoplasmosis. I would think of it as some sort of a monoliasis or torulosis if the generalized infection is due to a yeast-like organism.

LeRoy Sante, M.D.: I am particularly interested in the passage of gas via the urethra and just how that could occur. There is one means by which it could happen that has not been mentioned and that is a condition known as cystitis emphysematosa. Now, I know what the x-ray findings are and I can recognize it, but I am not quite clear as to just how it occurs. It is known to occur primarily in diabetic persons and once it has been present it can be duplicated by throwing the diabetic patient off balance again and I do not think that it necessarily has anything to do with infection. I know that the urologist can see millions of little bubbles bubbling off the surface of the mucosa as he looks at the bladder through the cystoscope and roentgenographically the picture is striking. The bladder filled with urine shows a halo around it that is perfect and unmistakable and, once one has seen it, he would never mistake it. It is also possible that there could be a fistulous tract between a diverticulum and the bladder. Another possibility is infection in the tissue due to B. coli. This organism is a gas producing organism and I have seen a number of x-rays in which the gas from the infection with B. coli in the interstitial tissue has dissected up the retroperitoneal structures and produced perirenal emphysema which has even gone into the chest and subcutaneous tissues.

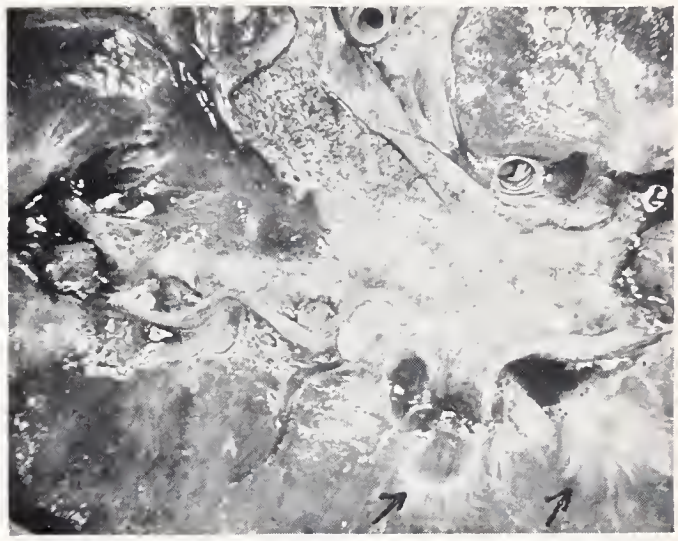


Fig. 1. Gross kidney transected. Arrows point to necrotic papillae. Note the light area demarcating the papillae from the surrounding kidney parenchyma. The pelvis is dilated and shows numerous petechial hemorrhages.

But in view of the fact that this cystitis emphysematosa is seen usually associated with diabetes, I think perhaps that might be the source of the gas in this case.

Herman T. Blumenthal, M.D.: I want to focus attention on the renal lesion. This patient died of uremia. I think that was quite obvious from the history and I think everyone was aware of that fact. He showed moderate malnutrition on gross inspection. He was a young individual, in his

middle thirties, and had a deep ulceration over the left elbow, on the heel of the right foot and also a large ulceration on the hip which was mentioned in the history. There was 3 plus bilateral ankle edema, no clubbing of the fingers, marked edema of the scrotum and some edema in the upper thigh regions bilaterally. That was the extent of the findings on gross inspection. He also

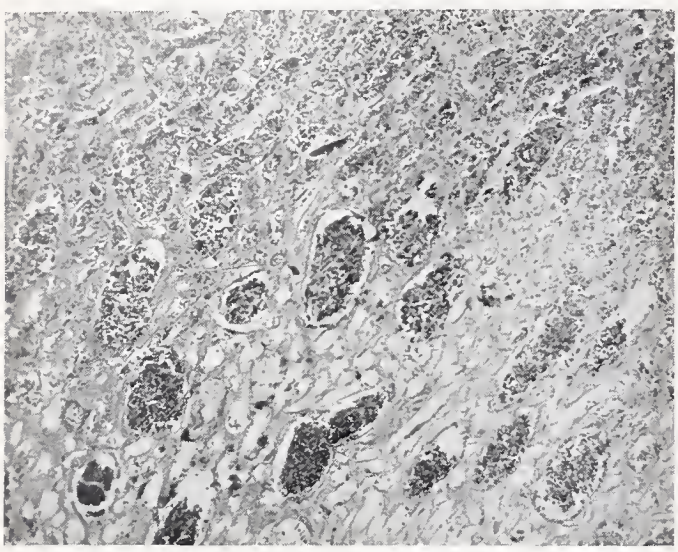


Fig. 2. Microphotograph of section through a renal papilla. Note dilated tubules filled with acute inflammatory exudate. In the lower half of the photograph there is loss of architecture due to extensive necrosis.

had 400 cc. of clear, yellow fluid in the pericardial cavity, 500 cc. in the left pleura and about 1,800 cc. in the right pleural cavity. There was 400 cc. in the peritoneal cavity. Only about 15 cc. of clear amber fluid was found in the pericardial cavity. He had a rather marked pneumonia, involving both lungs, an organizing type microscopically.

He had many of the gross findings that one would expect to find in association with uremia: (1) the fluid in the pleural cavities and in the peritoneal cavity, (2) an acute fibrinous pericarditis which extended somewhat into the superficial myocardium so that he had a focal acute myocarditis along with it. This patient also had an interstitial type of pancreatitis with a great deal of fibrosis of the pancreas, and the chronic inflammatory process extended into many of the islets and destroyed many of them. Now, whether there was enough to produce a diabetes as such or not I think is a debatable fact since it is known that something like 40 per cent of diabetic patients show nothing in their islets.

With the preliminaries then, I should like to emphasize the renal findings. The lesion shown in figures 1 and 2 demonstrate necrotizing papillitis.

It was first described by Friedrichs in 1877 in a 70 year old male who happened to be nondiabetic, but who was suffering from benign prostatic hypertrophy and all of the secondary urinary findings that go with urinary obstruction. However, the classical article describing this disease and containing in it a statistical analysis was published in 1937 by Gunther. The following data were taken from that article. In 32,000 necropsies, 859 cases or 2.7 per cent had diabetes. Of these 859, 62 or 7.2 per cent had necrotizing papillitis. There were in addition, forty-eight cases among nondiabetic patients. Of these latter, 85 per cent had urinary obstruction due either to benign prostatic hypertrophy, carcinoma of the prostate, urethral stricture from various causes or bladders containing calculi. Of the diabetic patients with acute pyelonephritis, 20 per cent had this lesion; apparently in addition to its association with diabetes. Necrotizing papillitis has a close association with acute pyelonephritis in diabetes. About 25 per cent of all the diabetic patients had acute pyelonephritis, and of these 5 per cent had the lesion. Of the nondiabetic, 3.3 per cent had acute pyelonephritis and 0.6 per cent of the latter had necrotizing papillitis. So, if one has a case of acute pyelonephritis and the patient also has diabetes, he has about a 500 to one chance of having acute necrotizing papillitis. In diabetes, the disease is predominantly in the female, the ratio being about two to one. In nondiabetic patients, the disease is predominantly in males, the ratio being about six to one and that is, of course, because of the common occurrence of urinary obstruction in the male due presumably to enlargement of the prostate. So one is dealing with an unusual form of acute pyelonephritis which occurs in diabetic patients over the age of 40, and in nondiabetic patients with acute pyelonephritis and urinary obstruction, especially benign prostatic hypertrophy.

Now, what are some of the factors in the pathogenesis of this disease? First, and I think it was obvious in this particular instance, that one is dealing with a bacterial infection and the production of the by-products of such infection, either toxins or, as in this case, the production of gas. Therefore in the absence of the emphysematous bladder and in the absence of a fistula between the bladder and the intestinal tract, the passage of gas per urethra becomes extremely important and the whole key to the diagnosis in this case is the statement that the patient complained of passing gas and white frothy urine per urethra. There is also the factor of back pressure which certainly deserves emphasis. In this disease, when it occurs in the male because of benign prostatic hypertrophy or other obstructing urinary lesions, the back pressure may have two functions. First, the stasis of urine produced by such back pressure offers a much better culture medium than urine which is on the move. Secondly, the back pressure may have an effect on the vascular bed of the papillae of the kidneys. The papillae are relatively avascular and anything that will embarrass the vascular supply to the renal papillae may produce renal necrosis because in effect this is a local type of infarction.

One author has compared this situation with a reverse Truetta shunt which has been described as a possible cause of lower nephron nephrosis. In the Truetta shunt the vessels in the cortex of the kidney shut down and the blood bypasses the cor-

tex through the shunt and only goes up into the medulla and then back out of the kidney. This author postulates that in necrotizing papillitis the vessels go immediately up to the cortex and then come immediately out without supplying the medullary tubules. While this is an interesting thought, there really is not a great deal of evidence to support it at this time.

Then, of course, in diabetes, because of acidosis, acetone bodies and diacetic acid, the urine frequently has a low pH. The acid urine will destroy leukocytes. For example, polymorphonuclear leukocytes are much better preserved in an alkaline urine than in an acid one. So the acid urine may act as a factor in destroying the body response to the infection. Finally, the role of fat metabolism in this particular lesion, I think, is extremely important. In the first place, Dr. Kinsella pointed out the role of fat metabolism in diabetes. Many people think that one of the important factors in diabetes is an abnormality in fat metabolism. I think, too, that even the chronic pancreatitis which occurred in this patient may be related to his generalized nutritional deficiency. In addition, there is experimental evidence that the lack of certain essential fatty acids will result in the production of necrotizing papillitis in rats. Rats placed on a fatty acid deficient diet particularly deficient in linoleid acid or some of the other unsaturated long chain fatty acids will develop necrotizing papillitis. The only other way that it has been produced experimentally is by the administration of vinylamine or of tetra hydroquinone. These two drugs apparently also have a differential focal effect on the papillae of the kidney and the lesion can thus be produced experimentally.

I do not think the latter observation has any direct application to the disease with which we are dealing but I do think that the experiments with fatty acid deficient diets have a direct application. In conclusion, therefore, we are dealing here with a disease called renal necrotizing papillitis, the diagnosis of which in diabetes depends on hematuria, renal colic without evidence of renal obstruction, unexplained coma in some instances and, in particular, a sudden increase in severity of symptoms of a known pyelonephritis. If there is passage of gas per urethra or if occasionally fragments of renal papillary tissue are found in the urine, then the diagnosis is, I think, reasonably apparent.

DR. MUETHER: Do I understand you to mean that the passage of gas through the urethra is of some significance in the diagnosis of this condition? Why is that?

DR. BLUMENTHAL: Because practically all of these cases are associated with either the staphylococcus aureus infection or with B. coli, both of which are gas producers, particularly the B. coli. In an overwhelming infection such as in this patient, the amount of gas produced is a great deal more than one gets in the average urinary infection and the production of this gas and its passage through the urethra, I think, is certainly a strong indication that one is dealing with this sort of thing.

DR. MUETHER: What you say is true but if this patient had a yeast infection of the bladder which also is associated with gas, he might present this symptom. I should think that the only thing that would be in your favor would be the statistical fact that many diabetic persons have this lesion.

DR. BLUMENTHAL: This patient also had B. coli cultured from the urine.

DR. MUETHER: That is true; they are extremely common in the urine of anybody who has a bladder infection. What I am driving at, of course, is, whether under these circumstances, one can make such a diagnosis clinically. You did not get many red cells in the urine or some of the other findings one might expect.

DR. BLUMENTHAL: How often does one see gas passed per urethra in the usual B. coli infection?

DR. MUETHER: It is extremely unusual. One finds fungus infection of the bladder in which one has practically a pure culture without much gas formation and that is what I find so hard to understand. It would seem that the fungi would be a better explanation for the gas than the colon bacilli.

DR. KINSELLA: This patient apparently had a central nervous lesion which I think was most likely due to pseudo diabetic tabes as Dr. Broun suggested. Unfortunately permission was not granted for an examination of the central nervous system. With regard to involvement of the kidney, that is obvious as explained by the pathologists. With regard to the infection, the matter is not clear. I think Dr. Muether's remarks covered that. Statistics show that nondiabetic patients may get such lesions. I think it is suggestive that the peculiar antagonism that exists between some infections and insulin, notably staphylococcal infection and insulin, might explain the preponderance of incidence of this disease in diabetic rather than in nondiabetic patients.

NEW DRUG SUCCESSFULLY USED TO COMBAT SKIN DISORDERS

Banthine bromide, a new drug, has been successfully used in the treatment of excessive perspiration and certain skin conditions aggravated or produced by it, an article in the *Archives of Dermatology and Syphilology* reported.

"It is our impression that banthine is of definite value in the treatment of certain diseases of the sweat glands," according to Drs. Crawford S. Brown of Boston and I. Lewis Sandler of Washington. Dr. Sandler is assistant professor of dermatology at the Georgetown University School of Medicine.

Twenty-seven persons suffering from excessive perspiration or common skin disorders associated with it were given oral doses of the drug. Observational studies of the results were made for an average of eight weeks.

According to the report, 74 per cent of the patients showed marked improvement, 19 per cent showed moderate improvement and seven per cent showed slight improvement.

"In general, symptomatic improvement [of menopausal symptoms] was striking within 7 to 14 days after treatment..." with "Premarin."

Gray, L.: J. Clin. Endocrinol. 3:92 (Feb.) 1943.

Many clinicians have found that "Premarin" therapy usually brings about prompt relief of distressing menopausal symptoms. Furthermore, symptomatic improvement is followed by a gratifying sense of well-being in a majority of cases. This is the "plus" in "Premarin" therapy which tends to quickly restore the patient's normal mental outlook.

Four potencies of "Premarin" permit flexibility of dosage: 2.5 mg., 1.25 mg., 0.625 mg., and 0.3 mg. tablets; also in liquid form, 0.625 mg. in each 4 cc. (1 teaspoonful).

"Premarin" contains estrone sulfate plus the sulfates of equilin, equilenin, β-estradiol, and β-dihydroequilenin. Other α- and β-estrogenic "diols" are also present in varying amounts as water-soluble conjugates.

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Case Reports

SPOROTRICHOSIS VERRUCOSA CUTIS

HAL E. FREEMAN, M.D.

SPRINGFIELD, MO.

VERRUCOUS AND fungating sporotrichosis is rare. A "verrucous epidermal" form of sporotrichosis was mentioned by the Duke University mycologic group.[1] From Brazil, in 1945, a "papular sporotrichosis" was described. These authors[2] refer to two previous case reports of a comparable condition. Netherton and Hubler[3] presented before the Cleveland Dermatologic Society a verrucous case in May 1945. At approximately the same time Smith and Garrett[4] observed in El Paso a case of "verrucous sporotrichosis."

It is believed that few physicians think of Sporotrichum Schenckii as being of probable etiologic significance in isolated pustuloverrucous skin lesions. Sporotrichosis should, it is now evident, always be considered along with cutaneous blastomycosis, chromomycosis and other granulomatous fungous infections, tuberculosis verrucosa cutis, the halogen granulomas and syphilis in the differential diagnosis of any fungating, pustular and verrucous skin lesion.

In support of this the following case report is presented.

REPORT OF CASE

R. B., a white man, aged 63 years, had never been out of the Missouri Ozarks area where he was a farmer. His previous general health had been good and there was no history of recent or remote severe illness.

In March 1948 he developed a "little boil" on his left cheek at a site where there had been no remembered injury. This enlarged rather slowly and became firm and tumorous. He was referred to a physician for treatment of "cancer." This physician correctly informed him, however, that he did not have cancer. Further extension occurred and the patient received considerable penicillin in oil without effect.

He received several forms of treatment from several physicians. I saw him first on April 12, 1948.

Dermatologic examination revealed a purplish red, painless, verrucous, fungating and pustular lesion located near the center of the left cheek. It was approximately 4 by 4.25 by .6 centimeters in size and produced a moderate to profuse seropustular exudate. Induration was notable and an area of erythema extended a short distance around the granuloma. Other physical findings were not relevant or were normal. First impression of the lesion, as illustrated in figure 1, was that the condition was typical blastomycosis.

Laboratory Findings.—The urinalysis and the serologic tests for syphilis were negative. The platinum loop was used to obtain some purulent material from a newly broken pustule. No fungus was seen upon direct microscopic examination. (Sporotrichum is but rarely found by direct examination of material obtained from human lesions.) Inoculations were made on Sabouraud's medium. After eleven days at room temperature a pure white culture was observed. Culture mounts showed quite fine hyphae which were both aerial and intramedial. The hyphae were long, fine and filamentous, and were branching and septate. The conidia were mostly pyriform and were often clustered at the ends of the conidiophores.

Two subcultures became and remained yellowish white, waxy and glossy while two progressed from white to develop aerial hyphae and exhibit concentric alternate rings of white and brown color and later became dark brown to black in color. The growth in one bottle became quite coal black in color. There was more notable folding and rugosity in the lighter colored subcultures than in the darker ones.

It became apparent that the organism grown was Sporotrichum Schenckii.

Clinical Course.—In view of the pustular and verrucous character of the lesion and with no history of tuberculosis or of the ingestion of bromides or



Fig. 1

iodides, therapy was begun after the culture inoculations were made on the first day of observation. One gram of sulfapyridine was given four times daily for only one week. Potassium iodide was prescribed in rapidly progressing dosages up to 40 drops of the saturated solution three times daily. This dosage was decreased to 30 drops and was maintained for one month when it was discontinued because several small widely scattered pustules appeared on the trunk. (Iododerma.) This was not resumed. Medication consisted of one week of 4 grams of sulfapyridine daily and one month of approximately 90 drops of potassium iodide daily. It is perhaps of interest that after the first four days of treatment no pustules were present for further mycologic inoculations.

X-irradiation, 1,000 r units, was given in eight dosages beginning with a dose of 300 r and gradually decreasing the subsequent dosages. This was localized through a cone and the following factors were used: 80 kilovolts, 5 milliamperes, 8 inch skin target distance, no filtration and with varying times.

The response continued excellent and after five weeks there was no evidence at the site of the granuloma except a slight radio erythema. Both the clinical and cosmetic final results were satisfactory and have remained so for three years. The hairs were still growing from their follicles in the treated area.

SUMMARY

A case report of a single fungating, pustular, cutaneous granuloma caused by Sporotrichum Schenckii is presented. Mycologic findings are related. Negative results on direct examination

for fungi does not eliminate sporotrichosis as a possible diagnosis.

The term "tuberculosis verrucosa cutis" is well established in medical literature. In order that sporotrichosis will readily be considered in the differential diagnosis of verrucous fungating lesions, the name "sporotrichosis verrucosa cutis" is presented.

631 Cherry Street.

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URETHROPLASTY: USE OF BLADDER MUCOSA

ALAN J. STEVENSON, M.D.
ST. LOUIS
AND
JOHN FREDERICK MACKEY, JR., M.D.
ST. LOUIS

THE FOLLOWING case is reported because a strip of bladder mucosa was used in reconstruction of an extensively damaged posterior urethra.

CASE REPORT

B.B., a 63 year old Negro male, entered St. Mary's Infirmary, St. Louis, on November 29, 1950. He did not appear well oriented as to sequence of events but he stated that he had had an acute urethritis during World War I which was followed by stricture. This was manifested by a small caliber stream which frequently "shut off." It required frequent instrumentation throughout the years, and false passages resulted with fistula formation. A perineal urethrostomy was performed, but it eventually "closed over." He urinated through multiple openings about the scrotal sac. Purulent discharge also exuded from these openings. It became progressively more difficult to void. There has been associated frequency and dysuria.

Local examination revealed two small perineal fistulae and two additional fistulae at the penile scrotal junction. Calibration of the pendulous urethra revealed the length of the patent portion to be 7.5 cm., the proximal portion terminating in dense urethral and periurethral fibrous tissue. Under sodium pentothal anesthesia, repeated attempts to establish the continuity of the urethra were unsuccessful.

Physical examination was otherwise normal.

Reestablishing the previous urethrostomy was recommended, but the patient refused this suggestion.

Laboratory Findings.—Urinalysis was normal except for numerous white cells microscopically. Culture of the urine revealed streptococci and Aerobacter aerogenes. The white blood count was 6,400 with a normal differential. The red count was 4,270,000 with 11.5 grams of hemoglobin. The nonprotein nitrogen was 31 mg. per cent, the blood sugar was 96 mg. per cent, and the serology was negative.

From the Department of Urology, St. Louis University School of Medicine.

One cc. of duracillin and 0.5 grams of streptomycin were administered twice daily preparatory to operation. Immediately prior to the operation, the patient was requested not to void so that the bladder might fill and facilitate cystotomy. After procaine hydrochloride spinal anesthesia was induced, he was placed in the lithotomy position and the perineum, external genitalia and suprapubic region were prepared and draped. The bladder was exposed through a suprapubic midline incision. Examination revealed no vesical calculus or neoplasm, but there was marked trabeculation. The urethral and ureteral orifices appeared normal. A 24 F. sound was passed in retrograde

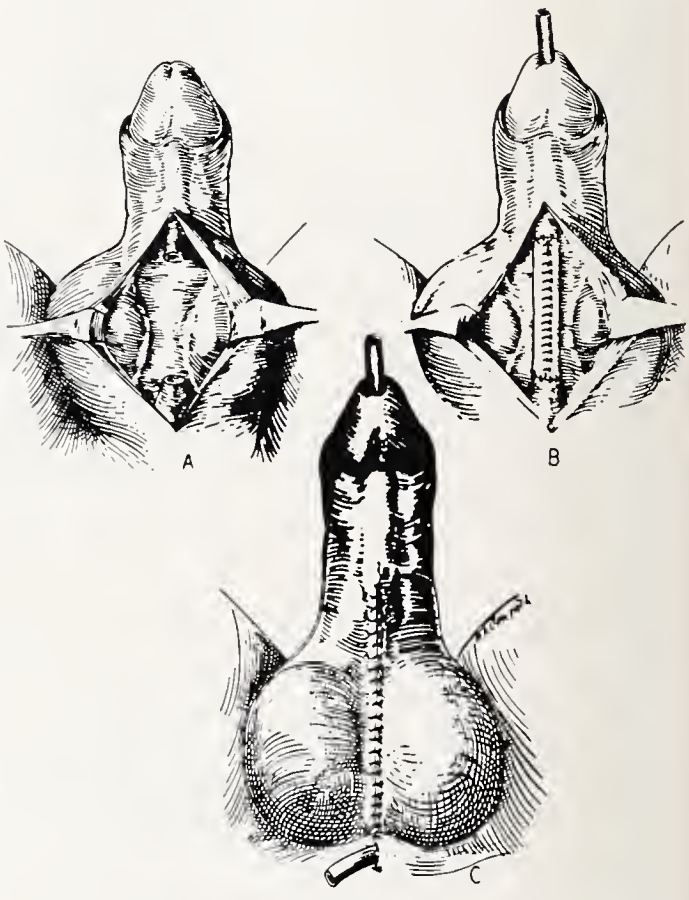


Fig. 1. A. The proximal and distal urethra with the intervening mass of periurethral scar tissue and distulae removed. B. The urethroplasty utilizing bladder mucosa. C. The completed operation.

fashion to the point of perineal obstruction and an incision was made through the densely scarred perineum down to the tip of the sound. The urethral lumen was observed to end abruptly in firm fibrous tissue. There was no continuity of the urethra from this point. The periurethral scar tissue, including the fistulous tracts, was dissected from the posterior point anteriorly, after the scrotum was bivalved (fig. 1 A). This block of tissue measured 8 by 7 by 4 cm. Intact urethra was encountered and a 20 F. 5 cc. bag catheter was passed into the bladder. A rectangular strip of bladder mucosa, measuring 2.5 by 8 cm., was dissected from the muscularis of the bladder vault. This was found to exceed slightly the circumference of the catheter and to bridge the interval between the intact proximal and distal urethra. The edges of the strip were approximated longitudinally over the catheter by means of 0000 chromic interrupted sutures and an end-to-end anastomosis was performed at either end of the strip to the intact urethral mucosa (fig. 1 B). This was covered with available fascia and skin closure was effected about a drain at the inferior angle (fig. 1 C). The bladder was closed with

0 chromic interrupted suture about a suprapubic angle tube. A Penrose drain was placed in the retropubic space and the abdomen was closed in layers. A retention suture was used to anchor the dorsum of the glans penis to the anterior abdominal wall.

Postoperatively, an area of slough developed at both extremities of the urethroplasty. The proximal area closed by secondary intention but a small fistula developed at the distal end.

After removal of the suprapubic and, subsequently, the urethral catheter, the patient was observed to void with a stream of good caliber. However, the stream rapidly diminished in size and the urethra required frequent dilitation due to recurrence of periurethral fibrosis.

Consequently, this procedure is not to be highly recommended.

994 Arcade Building.

APPENDICITIS DUE TO OBSTRUCTION OF APPENDIX BY GALLSTONE

IRWIN T. CRAIG, M.D.
JOPLIN, MO.

THE FINDING of foreign bodies in the appendix is not a rare occurrence. Fecaliths were found in 80 per cent of cases which terminated in gangrene and 44 per cent of the suppurative cases in a series reported by Wangensteen and Bowers.[1]

Ingested foreign material "shot, pins, glass, eggshell, enamel, bristles, hair, wood, pin worms, cherry stones, grape seeds, fig seeds, etc."[2] may produce appendicitis through local irritation or they may form a nidus for the formation of an appendiceal calculus.

True appendiceal calculi were found in 2.7 per cent of normal specimens and 33.3 per cent of acutely inflammed appendices in a series reported by Felson.[3] These may become extremely large. The largest appendiceal calculi known were those reported by Packard[4] measuring 1 cm. by 2 cm. by 4 cm. and the one reported by Bunch and Adcock[5] which measured 2.75 cm. in diameter.

An uncommon but rare cause of intestinal obstruction is the presence of gallstones in the bowel lumen. In the largest such collection of cases, that collected by Foss and Summers,[6] the location of the obstructing gallstone was as follows: Duodenum, six cases; jejunum, fourteen cases; ileum, 125 cases; colon, three cases and rectum, two cases; total, 150 cases.

In no instance was the offending gallstone found obstructing the appendix.

Since appendiceal lithiasis is not a rare occurrence but the finding of a true gallstone in the appendix is quite unusual, it seems advisable to submit stones found in the appendix to the laboratory for chemical analysis. The prognosis of cases presenting such findings is altered since this condition is always secondary to biliary calculi in the gallbladder.

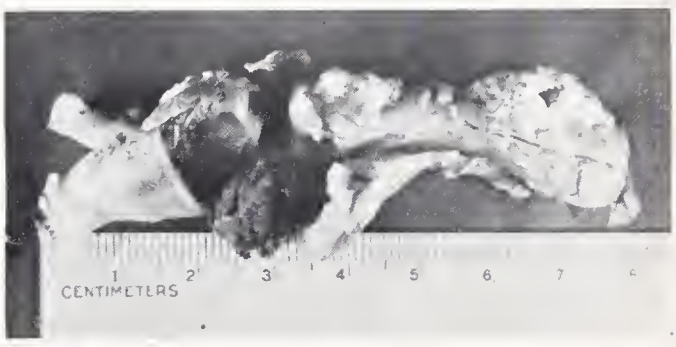
In searching the literature I was unable to find a report of a case identical with the one presented herewith.

CASE REPORT

Mrs. J. R., aged 26, white female, was admitted to the hospital with a chief complaint of pain in the right lower quadrant of eighteen hours duration. The discomfort had started in the right upper quadrant and had gradually shifted to the lower abdomen. There was tenderness in the right lower quadrant but no rigidity or rebound tenderness was noted. Urine examination was not unusual and the blood count showed a red count of 3,740,000 with 11.3 grams of hemoglobin. There were 11,850 white blood cells with 84 per cent polymorphonuclears, of which 83 per cent were segmented.

An emergency appendectomy was performed and a large amount of free fluid was found in the peritoneal cavity. The appendix was markedly distended and at its base there was a hard mass palpable in the appendiceal lumen. The upper abdomen was not explored.

On sectioning the removed organ a rough stone measuring 1 cm. by 1.5 cm. by 1.5 cm. was found within the lumen near the appendiceal base (fig. 1).



Surrounding the stone was a moderate amount of greenish fluid not unlike bile. The stone was sent to the Missouri State Health Department Laboratories who reported it "positive for cholesterol, phosphates, calcium and magnesium." The pathology report on the removed appendix was "acute suppurative appendicitis."

Cholecystograms were taken while the patient was in the hospital and the report was as follows: "There are shadows in the gallbladder area which are not radio-opaque. These are highly suggestive of cholesterol stones."

Three weeks postoperatively the patient had an attack of acute cholecystitis which responded to nonsurgical treatment. She has no complaints at the present time but is eating a low fat, low cholesterol diet.

607 Main Street.

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PRESIDENT'S PAGE

The older we grow, the more conscious we become of the pattern that repeats itself in the calendar of each passing year. In this pattern there is no pleasanter time than the holiday season that brings an old year to a close and starts a new one.

The Christmas season is a time when tensions and pressures relax, a time when conscious enjoyment of the good things in our lives takes precedence over our workaday concern with problems and with difficulties.



For most of the year, it is altogether right that we should apply ourselves to the jobs that need doing. There is no denying that the problems of peace and war, plenty and poverty, health and disease in our world—and in our State of Missouri—today challenge our best effort and excite our deepest concern.

But now at the Christmas season, I think it valuable to turn our thoughts from the welter and the press of things that need to be done and to take a quiet inventory of all the good we now enjoy . . . to count up the capital that has been earned for us by effort in the past, by those who have gone before us.

And what a heartening capital account it is for us Americans! In a sick and troubled world, we stand out as the best hope of health and peace.

We of the medical profession, in particular, have special reason to be proud of the great inventory of America. The doctors of this nation have won major victories in the field of science. We continue to make great strides toward solving in a voluntary way the economic problems that underlie good health care for all.

At this time of quiet in the busy year, I wish to extend to every member of the Association a most cordial good wish for Christmas and for the New Year. I wish, too, to express my confidence that, as we have made our contribution to the well-being of our fellow citizens in years past, so we shall continue in the year ahead to make the influence of the medical profession in Missouri a constructive one—an influence not unworthy of the aspirations that at Christmas time fill the minds of men of good will everywhere.



Editorials

RAPID GROWTH OF URBAN POPULATION

For at least a century the urban population of the United States has been growing more rapidly than the rural, according to statistics of the Metropolitan Life Insurance Company. It is only with the last few decades, however, that the country has become predominantly urban. The Census of 1920 was the first to show urban residents in the majority, but only by a slender margin of 51 per cent of the total population. By 1950, the poportion in urban areas had increased to 59 per cent. A century ago it was only 15 per cent.

Migration from farms and from foreign countries has kept cities well supplied with inhabitants. Even in the second half of the last century, while there was a widespread movement to farms in the West and Midwest, the population in urban areas grew at a rate three times that in rural areas. In the present century the increase has been four times as fast.

The population in the larger cities has shown the most rapid rate of growth. Migration from overseas during the last century helped materially to swell the proportion of the population in cities with 100,000 or more from 5 per cent in 1850 to 19 per cent in 1900. Since then, internal migration as well as the continuing stream of immigrants from abroad have brought the proportion of the total population in such cities to 29 per cent. Meanwhile, the number of cities with 100,000 or more inhabitants rose from six in 1850 to 106 at present.

Of special interest are the population trends in the largest cities. The proportion of people living in cities of 1,000,000 or more population increased steadily from 2.4 per cent in 1880 to 12.3 per cent in 1930; since then, the proportion has decreased slightly. This decline is deceptive, however, since it relates only to the population within the political boundaries of the cities and does not include the fast growing suburban areas. The five cities of 1,000,000 or more—New York, Chicago, Philadelphia, Los Angeles and Detroit—and the surrounding communities that make up their metropolitan areas increased their proportion of the total population from 18.9 per cent in 1930 to 19.5 per cent in 1950.

There has been a spectacular increase in population in the outlying areas of the major cities during the last decade. A preliminary report by the Bureau of the Census shows that while the population in the central cities of metropolitan areas increased by 13.0 per cent from 1940 to 1950, the outlying parts of those areas grew by 34.7 per cent. This growth in the outskirts of the large cities accounted for nearly half of the total population increase of the country within the decade.

The long term trend toward the urbanization of the population is continuing. At the same time there is a distinct tendency for the large cities to decentralize. This may well be the pattern of future population growth.

ARMY MEDICAL PERSONNEL WIN OUTSTANDING NUMBER OF DECORATIONS IN KOREA

More than 2,800 decorations have been awarded to Army Medical Service personnel for service in the Korean campaign, Major General George E. Armstrong, Army Surgeon General, has announced.

The total includes the first award of the Congressional Medal of Honor which was awarded posthumously to Private First Class Richard G. Wilson, Cape Girardeau, of the Medical Company, 187th Airborne Infantry Regiment. There have been nine Distinguished Service Crosses, two Distinguished Service Medals, 149 Silver Stars, twenty-eight Legion of Merit awards, two Distinguished Flying Crosses, eleven Soldier's Medals, 1,369 Bronze Star Medals, nine Air Medals, 126 Commendation Ribbons and 1,110 Purple Hearts.

Eighty-five per cent of the decorations were awarded to Army Medical Service enlisted men. In addition to the Medal of Honor these included eight Distinguished Service Crosses, 122 Silver Stars, eight Soldier's Medals, 1,080 Bronze Star Medals, 103 Commendation Ribbons and 1,068 Purple Hearts.

Medical Service Corps officers serving as assistant battalion surgeons, administrators, supply officers or in similar capacities, received almost 10 per cent of the total, including twenty Silver Stars, seven Legion of Merit awards, two Distinguished Flying Crosses, three Soldier's Medals, 192 Bronze Stars, one Air Medal, eleven Commendation Ribbons and thirty-six Purple Hearts.

Medical Corps officers received 105 decorations, including one Distinguished Service Cross, two Distinguished Service Medals, seven Silver Stars, eighteen Legion of Merit awards, fifty-nine Bronze Star Medals, eight Air Medals, six Commendation Ribbons and four Purple Hearts.

Sixteen dental officers were decorated. Awards included one Legion of Merit, eleven Bronze Star Medals, two Commendation Ribbons and two Purple Hearts. One veterinary officer received the Bronze Star.

Awards to the Women's Corps of the Army Medical Service totalled thirty-two, including two Legions of Merit, twenty-six Bronze Stars and three Commendation Ribbons to Army Nurse Corps officers, and one Commendation Ribbon to an officer of the Women's Medical Specialist Corps.

Organization and Economics

NEWS

Carroll P. Hungate, M.D., Kansas City, was awarded Honorable Mention at the annual meeting of the Mississippi Valley Medical Society held at Peoria on September 19 to 21.

The Missouri State Board of Medical Examiners will meet on February 11, 1952, to consider reciprocity applications. Examinations will be given in Jefferson City on February 19, 20 and 21, 1952.

Leo J. LeBlanc, M.D., St. Louis, will address the General Practitioners Study Club of Greater St. Louis on December 19 on "Office Management of Some of the More Commonly Seen Anorectal Diseases."

Robert Mueller, M.D., St. Louis, was the guest speaker at a tea given by the Woman's Auxiliary to the Franklin County Medical Society in Washington on October 16 attended by approximately 150 women. He spoke on "Socialized Medicine."

Harold L. Gainey, M.D., Kansas City, spoke on "Endometriosis in Pregnancy, Clinical Observations," at the annual meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons at Hot Springs, Virginia.

Victor E. Scherman, M.D., St. Louis, was elected president of the Doctors' Medical Foundation of St. Louis at a meeting on October 15.

Melvin A. Casberg, M.D., St. Louis, Dean of the St. Louis University School of Medicine, St. Louis, has resigned from that position, to be effective on July 1, 1952, for reasons of health.

An oil painting of Dudley S. Conley, M.D., Columbia, Dean Emeritus of the University of Missouri School of Medicine, was presented to the University by alumni of the medical school on November 9 at a faculty-student assembly in McAlester Hall. Dr. R. Claude Bruner, president of the School of Medicine Alumni Association, made the presentation. Dr. Conley was dean of the Medical School from August 1, 1933, until his retirement on August 31, 1948.

Charles P. Bailey, M.D., Philadelphia, was the guest of the Missouri Heart Association, the Kansas City Chest Surgeons and the staff of the Kansas City General Hospital on October 26 and 27 and performed introcardiac operations on the two mornings and conducted a clinic on the evening of October 26, all of which were televised to the Municipal Auditorium. He was assisted by Kenneth Kowan, M.D., Philadelphia, anesthetist.

MUSINGS OF THE FIELD SECRETARY

The Council on Medical Service of the American Medical Association called a conference on Physician Location Services in Chicago on October 12. The purpose of this conference was to explore ways and means of activating the statement of the American Medical Association Board of Trustees, as given to and approved by the House of Delegates in June, recommending the expansion of Physician Placement Service activities. It seems that many of the state medical associations are offering little, if any, service to physicians looking for locations, or to communities seeking physicians.

A few associations, however, are apparently maintaining effective placement services. They keep up-to-date lists of physicians known to be seeking locations as well as lists of locations needing physicians. There is, of course, variation in the amount of detailed information on physicians and locations which is kept available.

The basic tenet of this conference was that physician placement services are extremely important and that state medical associations should assume a major responsibility to this end. The American Medical Association is in position to aid these placement services but in the final analysis the state medical association should know its own backyard better than anyone else.

DEATHS

Braecklein, William A., M.D., Tucson, Arizona, a graduate of Missouri Medical College, St. Louis, 1888; honor member of the Lafayette County Medical Society; retired; aged 84; died August 18.

Reynolds, Stephen D., M.D., Plattsburg, a graduate of Ensworth Medical College, St. Joseph, 1890; honor member of the Clinton County Medical Society; aged 82; died September 25.

Gashwiler, J. S., M.D., Novinger, a graduate of the Medico-Chirurgical College of Kansas City, 1900; member of the North Central Counties Medical Society; aged 73; died October 4.

West, William M., M.D., Monett, a graduate of Beaumont Hospital Medical College, St. Louis, 1898; honor member of the Ozarks Counties Medical Society; aged 78; died October 6.

Gale, William S., M.D., Osborn, a graduate of Barnes Medical College, St. Louis, 1905; member of the DeKalb County Medical Society; aged 75; died October 29.

SYMPOSIUM ON CANCER OF THE STOMACH

A symposium on "Cancer of the Stomach" will be held Saturday, December 1, at the Ellis Fischel State Cancer Hospital, Columbia, sponsored by the Missouri Society of Pathologists and the Missouri Division of the American Cancer Society.

Guest speakers will be Edward B. Benedict, M.D., Boston, endoscopist; Gordon P. McNeer, M.D., New York, surgeon; Malcolm B. Dockery, M.D., Rochester, Minnesota, pathologist; Leo G. Rigler, M.D., Minneapolis, radiologist.

The meeting will begin at 10:00 a. m. and will consist of presentations of recent advances in diagnosis and therapy of gastric cancer, to be followed by invited and general discussion. The meeting is open to all interested physicians.

SOCIETY PROCEEDINGS

FIRST COUNCILOR DISTRICT

DONALD M. DOWELL, CHILLICOTHE, COUNCILOR

Clay County Medical Society

Approximately 100 physicians attended the third Annual Clay County Medical Society Clinical Conference held at the Elms Hotel, Excelsior Springs, on Thursday, November 1.

The meeting began with a luncheon session, followed by a full afternoon's scientific presentation and then a dinner session.

Speakers for the three programs were: A. N. Lemoine, Jr., M.D., Kansas City; Buford G. Hamilton, M.D., Jefferson City; Edward F. Rosenberg, M.D., Chicago, Ill.; Paul O. Hagemann, M.D., St. Louis; B. B. Wells, M.D., Little Rock, Ark., and S. H. Wills, M.D., Houston, Texas.

S. R. McCRACKEN, M.D., Secretary.

SECOND COUNCILOR DISTRICT

W. F. FRANCKA, HANNIBAL, COUNCILOR

Marion-Ralls County Medical Society

The Marion-Ralls County Medical Society held a dinner meeting at the Mark Twain Hotel, Hannibal, on October 16. Thirty physicians were in attendance to enjoy and benefit from the following program:

Llewellyn Sale, Jr., M.D., St. Louis, spoke on "Diagnosis and Treatment of Glomerulo Nephritis."

R. Hackmeyer, M.D., St. Louis, discussed "The Management of Common Proctolgic Conditions."

Among the guests present were: Drs. R. L. Andrae, E. A. Cunningham and C. H. Lewellen, Louisiana; G. H. Hooker, Clarksville, and Harold Swanberg, Quincy, Ill.

R. J. LANNING, M.D., Secretary.

FOURTH COUNCILOR DISTRICT

JOHN O'CONNELL, OVERLAND, COUNCILOR

Jefferson County Medical Society

The Jefferson County Medical Society met on October 5 in Crystal City at the office of Drs. R. H.

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Donnell and V. E. Schulein. The meeting was called to order by the president, Dr. Thomas A. Donnell, DeSoto.

Mr. Thomas Bowdon, chairman of the Jefferson County Blood Bank program, gave a brief presentation of the present status of the program and asked for approval for the Society, which was unanimously given.

Millard F. Arbuckle, M.D., was voted a member by transfer from the St. Louis Medical Society.

James G. Janney, M.D., and James P. Murphy, M.D., St. Louis, led the discussion on two heart cases which were presented by members of the Society.

The secretary was instructed to find out procedure on obtaining Blue Cross and Missouri Medical Service for members of the Society and if possible to have a representative present at the next meeting.

Those present were Drs. B. Bolgar, Festus; Thomas Dobbins, Hillsboro; Harold Donnell, Thomas Donnell, Charles E. Fallet and Karl V. McKinstry, DeSoto; R. H. Donnell, J. F. Rutledge and V. E. Schulein, Crystal City.

John F. Rutledge, M.D., Secretary.

St. Louis County Medical Society

The St. Louis County Medical Society met at the Health Center, St. Louis County Hospital, on October 24.

A letter was read regarding the St. Louis Clinical Diabetes Association's fourth annual Diabetes Detection Drive November 5 to 17 and the Society voted endorsement.

Martyn Schattyn, M.D., St. Louis, spoke on "Urological Problems in General Practice," which was followed by discussion.

Adjournment of the meeting was followed by refreshments served by the Woman's Auxiliary.

M. A. Diehr, M.D., Secretary.

NINTH COUNCILOR DISTRICT

E. C. BOHRER, WEST PLAINS, COUNCILOR

South Central Counties Medical Society

The South Central Counties Medical Society held a dinner meeting at the El Patio Hotel, Cabool, on October 17, with the following members and visitors present: Drs. R. W. Denney and A. C. Ames, Mountain Grove; Garrett Hogg, Jr., Cabool; T. J. Burns, Houston; Leslie Randall, Licking; M. B. Perkins, Willow Springs; T. B. Skaggs, Mountain View; E. C. Bohrer, Rollin H. Smith and C. F. Callihan, West Plains; W. S. Sewell, Springfield.

Following dinner, the president, Dr. Burns, called the meeting to order.

Jack N. Wiles, M.D., Bakersfield, who is taking an internship in Kansas City, was voted into membership.

Dr. Sewell discussed "Pyelitis and Nephropyelitis of Children" and showed films, following which a vote of thanks was given Dr. Sewell.

The Society adjourned to meet in Willow Springs on November 15.

A. C. Ames, M.D., Secretary.

Mineral Area County Medical Society

The Mineral Area County Medical Society met at State Hospital No. 4, Farmington, October 30.

The program was under the direction of the American Academy of General Practice and consisted of addresses by Daniel Sexton, M.D., and R. O. Muether, M.D., St. Louis.

Those present were Drs. C. H. Appleberry and P. L. Jones, Flat River; Ben M. Bull, Ironton; C. J. Clapsaddle and Richard Lanning, Ste. Genevieve; F. R. Crouch, E. F. Hoctor, S. A. Lanzafame and James J. Stout, Farmington; J. L. Foster, Desloge; M. T. Haw and H. M. Roebber, Bonne Terre; S. C. Slaughter, Fredericktown.

The Woman's Auxiliary met at the same time and a discussion was held concerning medical public relations.

James J. Stout, M.D., Secretary.

TENTH COUNCILOR DISTRICT

FRANK HALL, CAPE GIRARDEAU, COUNCILOR

Perry County Medical Society

The Perry County Medical Society held its October meeting at the new Perry County Hospital, Perryville, on Thursday evening, October 11.

A clinical heart conference represented the program for the evening. Two members of the Society, J. J. Bredall, M.D., and O. A. Carron, M.D., Perryville, presented case histories and work-ups on two heart patients for discussion. The two cases were children, both of whom were presented in person.

J. G. Janey, Jr., M.D.; Chester P. Lynxwiler, M.D., and E. Lee Shrader, M.D., St. Louis, of the Cardiovascular Section of the St. Louis University School of Medicine, participated as consultant discussants. The program was unusually interesting and practical.

J. F. Lutkewitte, M.D., Secretary.

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Advertisement



From where I sit
by Joe Marsh

Easy Makes His "Cat" Tread Lightly

Driving home on Three Ponds Road yesterday, I was flagged down by Easy Roberts' boy Skeeter. "Take it slow," he advised. "Dad's crossing with our tractor, just beyond the bend."

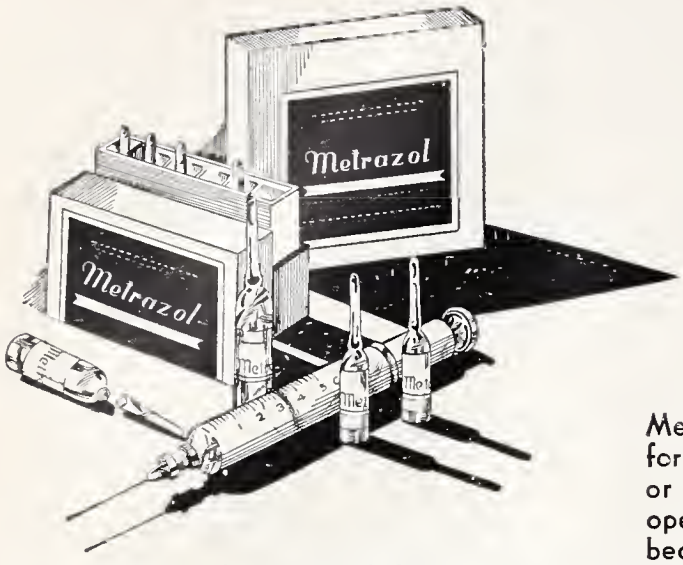
Around the curve I saw why Skeeter stopped me. Easy had laid two rows of old truck tires across the road, and was driving his new "Cat" tractor over them!

"A little more trouble this way," Easy explains, "but it keeps those tracks from tearing up the asphalt when I cross over to our other fields. After all, the roads belong to all of us—and I guess I'd get mad if someone else chewed them up."

From where I sit, Easy is my kind of citizen. He doesn't just give democracy lip service—unlike certain other people who are always prescribing what "road" we should take. Whether it's practicing a profession, the choice of your favorite beverage, or the right to use the public highways, I figure it's up to all of us to protect every individual's "right of way."

Joe Marsh

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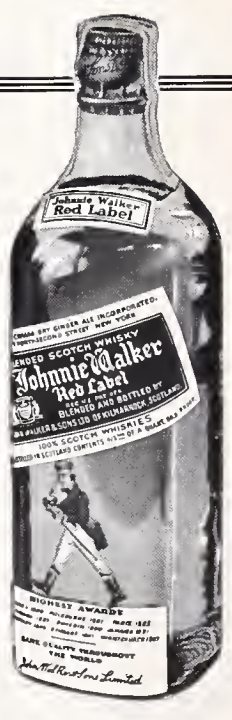
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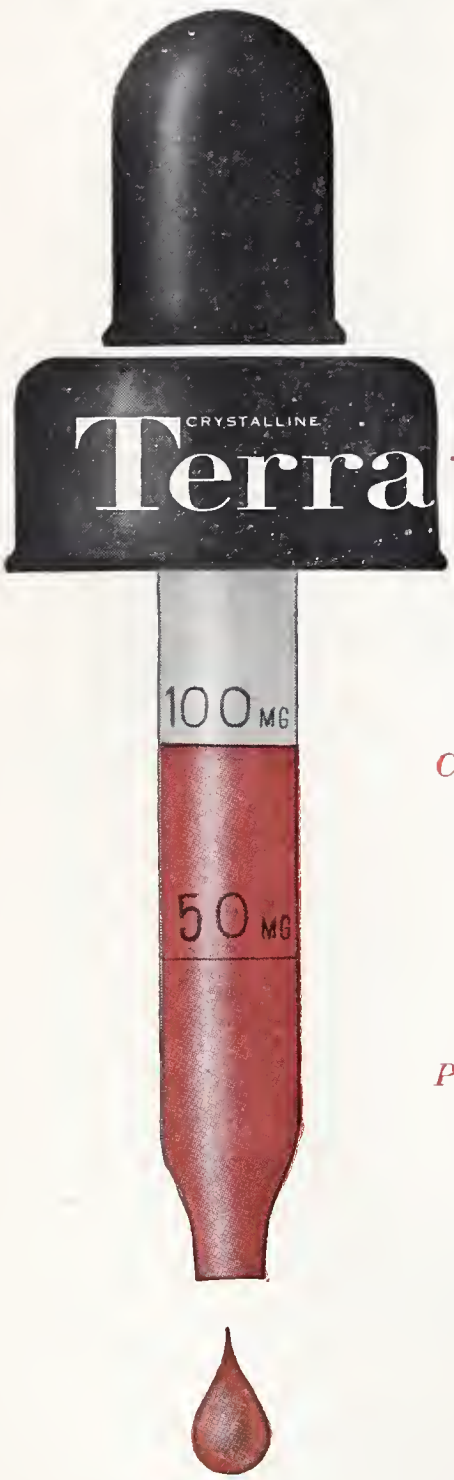
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Immunology by Noble Pierce Sherwood, Ph.D., M.D., F.A.C.P., Professor of Bacteriology, University of Kansas, and Pathologist to the Lawrence Memorial Hospital, Lawrence, Kansas. Third Edition. Illustrated. C. V. Mosby Company, St. Louis, 1951. Price $8.00.

The author traces the development of immunity from a consideration of infection and infectious agents, through the relationship between host and parasite and the protectial responses of the host to the development of host immunity. He discusses the nature of the many factors which represent host immunity and concludes with a consideration of hypersensitivity. The book consists of more than six hundred and fifty pages and it is felt that no important reference is ommitted and no detail slighted. There is adequate description of technical procedures applicable to the laboratory, but this book is not in any sense a laboratory manual. It is rather a learned presentation of the theoretical and experimental bases upon which present concepts of immunity are founded.

By reason of its comprehensive and encyclopedic nature it will appeal more to the specialist in this field rather than to a wide number of practitioners. However, it should also find wide use as a reference text for the internist. C. J. S.

Current Therapy 1951, Latest Approved Methods of Treatment for the Practicing Physician. Editor Howard F. Conn, M.D. Consulting Editors: M. Edward Davis, Vincent J. Derbes, Garfield G. Duncan, Hugh J. Jewett, William J. Kerr, Perrin H. Long, H. Houston Merritt, Paul A. O'Leary, Walter L. Palmer, Hobart A. Reimann, Cyrus C. Sturgis and Robert H. Williams. W. B. Saunders Company. Philadelphia and London. 1951. Price $10.00.

"Current Therapy 1951" is similar in format and organization to "Current Therapy 1950." There has been considerable revision and addition of articles—"forty-nine new contributors have been added and eighty-six of the 'Methods' are new and many others have been significantly changed."

There can be no question but that the average practitioner will find this a useful and convenient reference for the management of some of his daily problems. B. S. P.

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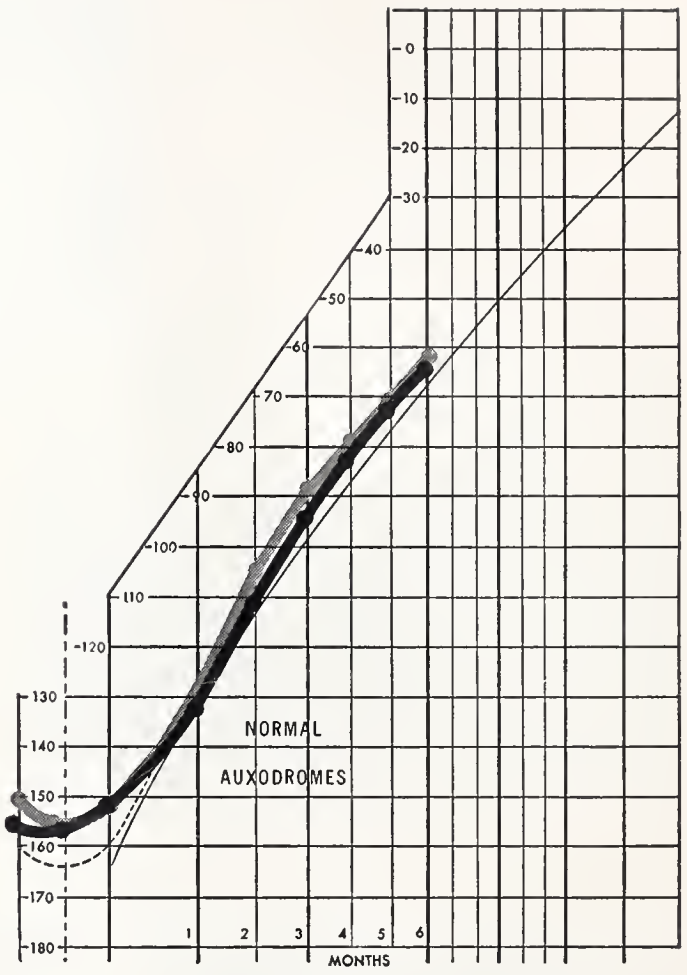
Normal schedule of development (auxodrome) plotted on Wetzel Grid.[1]

CURVE A

Composite Wetzel Grid auxodrome of 60 unselected infants on S-M-A from birth to 6 months of age.

CURVE B

Growth data, recomputed on Wetzel Grid, based on "selected subjects, most of whom were favored by environment;"[2] age: from birth to 6 months.



1. Wetzel, N. C.: J. Pediat. *29*:439, 1946.
2. Jackson, R. L., and Kelly, H. G.: J. Pediat. *27*:215, 1945.

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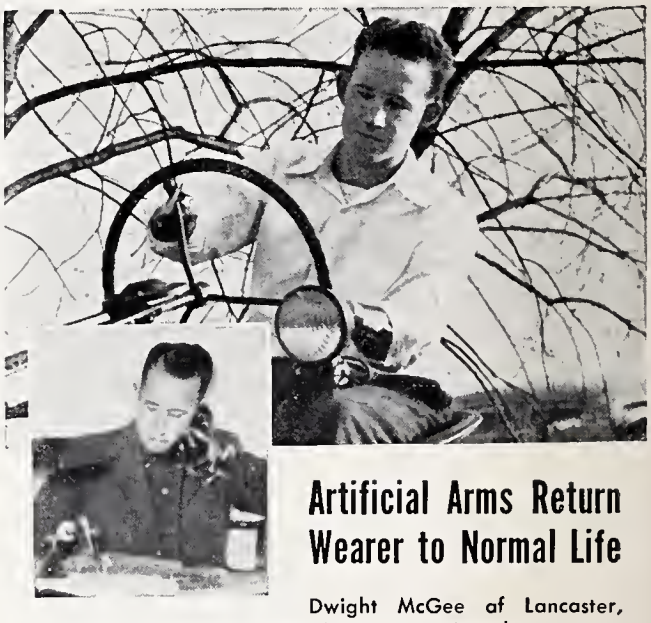
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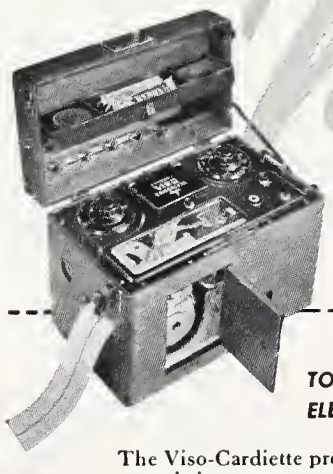
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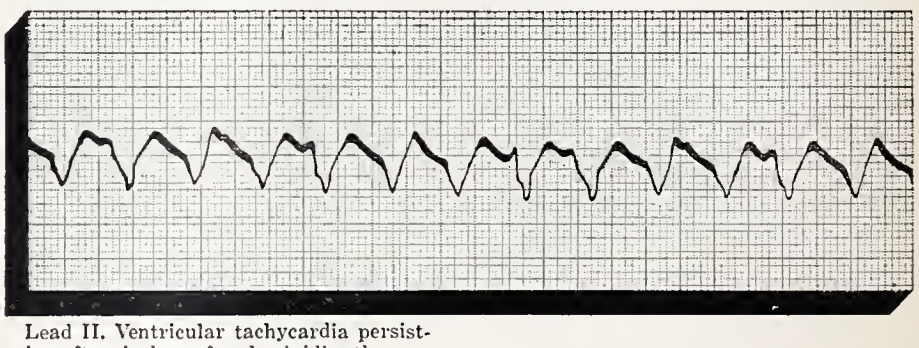
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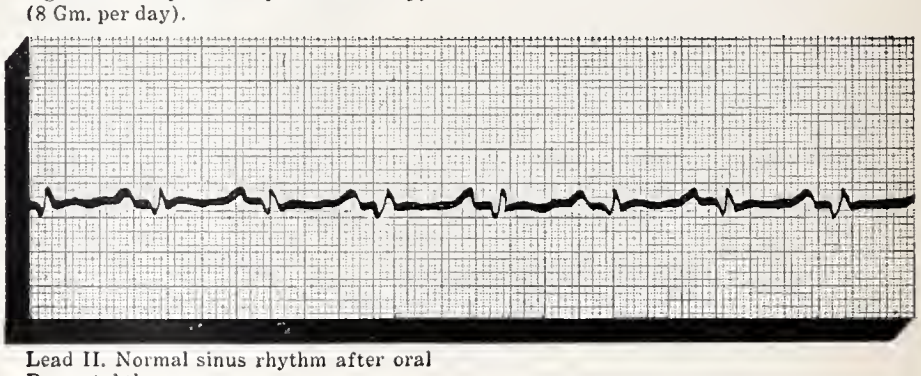
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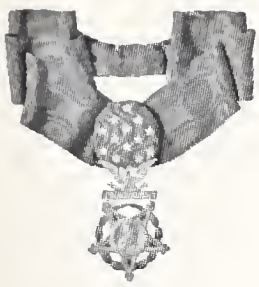
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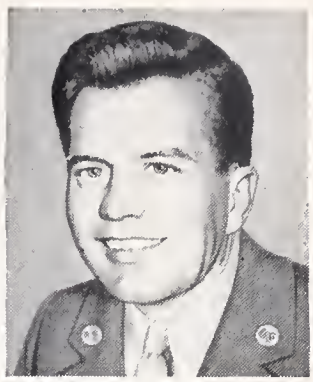
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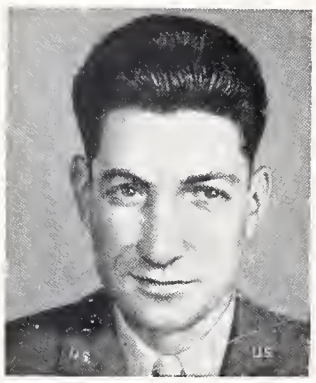
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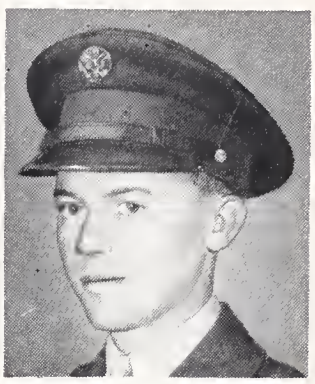
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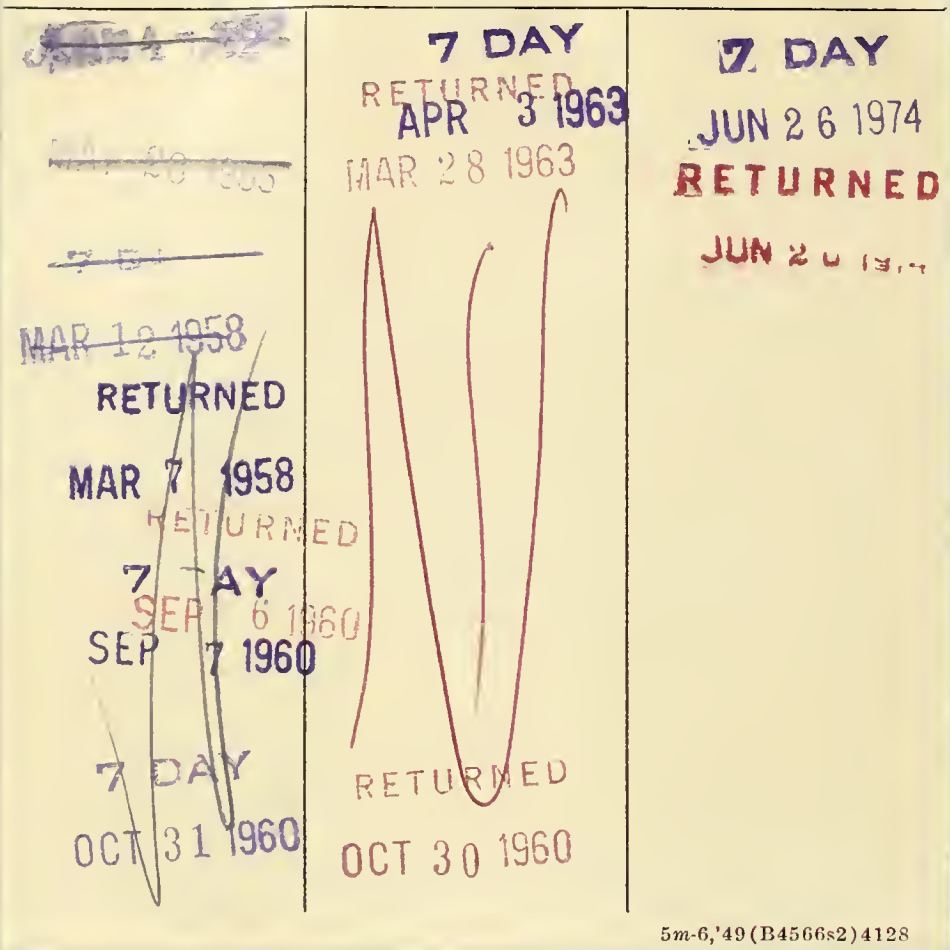
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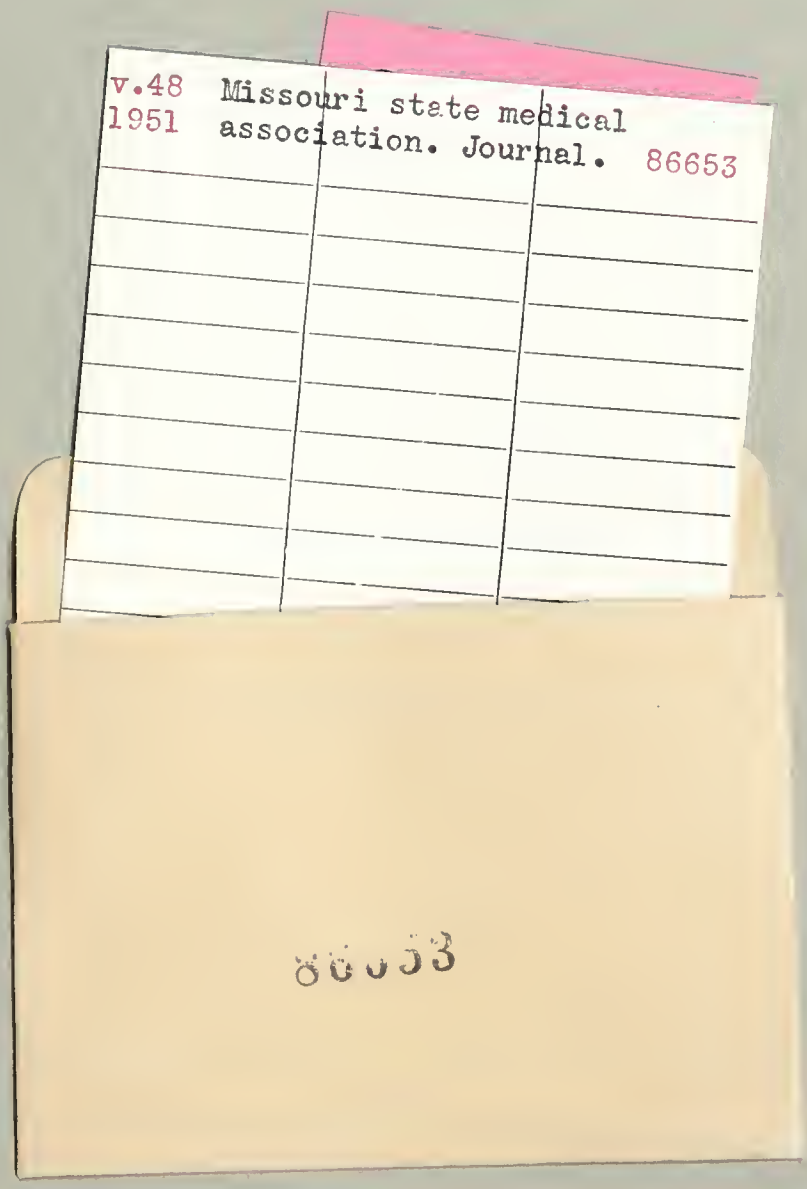
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